

The Milbank Memorial Fund
QUARTERLY

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IN THIS ISSUE

THE application of medical knowledge available for early diagnosis of disease in presumably healthy persons has lagged much behind the progress that has been made in this field of preventive medicine. Public health and medical programs for the early detection and care of the tuberculous individual have demonstrated the need and value of this approach in the control of tuberculosis. Results of the examinations of selectees for Army service have shown how numerous are the health problems that can be uncovered in apparently well individuals if thorough examinations are made. In an article entitled "A Program of Preventive Medicine for the Individual," Dr. Milton I. Roemer summarizes the principal preventive measures available for control of disease, and directs attention not only to the importance of expanding the traditional public health practices for environmental control of disease and mass prophylaxis but also to the need for a preventive approach to the increasing problem of degenerative diseases.

"It is the purpose of this paper," writes Dr. Roemer, "to take inventory of these known preventive measures with a rough estimate of what their cost would be as part of an organized group medical service." For the services suggested, Dr. Roemer estimates an annual cost of about \$5.40 per capita. The choice of services is based on "the principle of selective procedures, adjusted to particular demographic groups," that is, the content of the health examination is not the same for all persons but is adjusted to individuals on the basis of sex, age, geographic location, and possibly other factors to detect those diseases which experience has shown are most likely to occur.

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Improvement in the nutritional status of families exposed to infectious tuberculosis has been one of the objectives of an experimental program for the control of the disease among Negroes. The article, "An Experi-

ment in Nutrition Teaching by Public Health Nurses," by Jean Downes and Anne Baranovsky describes the diets of sixty tuberculous families in a Harlem area of New York City in 1943 before and after special nutrition teaching was given by the public health nurse.

Significant increases were found in the use of specific foods after teaching; the greatest increases occurred in the use of green or yellow vegetables and in the use of all vegetables. A comparison of the reported use of five food groups with the dietary pattern recommended by the Food and Nutrition Board of the National Research Council showed that a greater proportion of the families had diets equal to or above the recommended standard after the teaching period than before special instruction was given. An analysis of the content of the nurses' teaching revealed that on the whole most families needing advice about the use of specific foods were given such advice.

The public health nurse has an unusual opportunity to give dietary instruction to families with serious health problems and it is desirable and feasible that her teaching program should emphasize the betterment of food habits as one important preventive health measure.

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During the past fifteen years there has been an enormous increase in the use of field surveys for collecting first-hand data on given situations. Expansion in work of this type has occurred not only in governmental agencies but also in research organizations and commercial firms. Although individuals responsible for specific investigations may employ the means at hand for testing the accuracy of their data to their own satisfaction, only a few systematic analyses of accuracy in field surveys have been published. In this issue P. K. Whelpton and Clyde V. Kiser present an article on the completeness and accuracy of a household survey in Indianapolis which was undertaken for the purpose of locating couples with qualifications for inclusion in a more intensive study. The analysis is made for a series of rather simple questions that were asked in both investigations and is carried through by certain characteristics of the informant. The article is the third to appear under the general title "Social and Psychological Factors Affecting Fertility."

A PROGRAM OF PREVENTIVE MEDICINE FOR THE INDIVIDUAL¹

MILTON I. ROEMER, M.D., M.P.H.²

WITH advances in knowledge, it is increasingly difficult to distinguish between therapeutic and preventive medicine. In reality, there is no hard line between them; the fence that has been built has not been made from the timber of rational science.

Because medical science historically, and perhaps inevitably, developed its theory and practice from concern for the full-blown disease picture, knowledge of and concern for prevention has been slow in coming. And yet the sphere of disease which, with all possible resources of social and scientific organization, is preventable is a wide one.³

LEVELS OF PREVENTION

Preventive practices may, of course, proceed on different levels. They may be (a) entirely environmental, so controlling external factors that individuals are not adversely affected; (b) protective of the individual, when environmental control is not complete; (c)

¹ The subject of this study was suggested by Professor Nathan Sinai of the University of Michigan School of Public Health.

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³ The major categories of disease which may be considered preventable by modern medical and related sciences have been listed by Haven Emerson in *PREVENTIVE MEDICINE IN MODERN PRACTICE* (New York, 1942) as follows:

1. Communicable Diseases (acute and chronic)
2. Nutritional Disorders (malnutrition and obesity)
3. Drug Addiction (including alcoholism)
4. Allergy
5. Mental and Nervous Disorders
6. Occupational Diseases
7. Cancer (certain types)
8. Heart Disease (non-degenerative)
9. Complications of Maternity
10. Hereditary Disorders (eugenics)
11. Growth and Development of Children (exogenous factors and endocrine disorders)
12. Accidents (industrial, home, and public highways)
13. Dental Disease

directed toward the prompt detection of disease in the individual, when it is at an early stage and readily curable. Or it may, of course, be a combination of any of these. In venereal disease control, for example, the elimination of prostitution would represent the first and most basic approach; the use of prophylaxis would represent the second; the performance of routine serological tests would represent the third; or, as we know is attempted in practice, the combination of all three may be effected.

While the concept of prevention thus is relative, including the early diagnosis of disease, much of what would be considered pure therapy is, on the other hand, actually preventive. Iodine therapy of hyperthyroidism prevents future heart disease, and arsenical therapy of syphilis prevents future paresis. Even surgery is often preventive of anticipated difficulties; hernial repairs eliminate the hazard of acute intestinal obstruction and tonsillectomies may reduce the severity of future upper respiratory tract infections.

The most practical arbitrary line that may be drawn to define the concept of preventive services to the individual is, perhaps, to consider as preventive a *health service rendered to the presumably normal person*. Once a specific disorder has been detected, its correction—while preventive of future difficulties—would arbitrarily not fall under this concept.

Because the most basic preventive approach, taking its origin in environmental sanitation and the control of the acute communicable diseases, required organized community action, the province of prevention has been left largely to government agencies of public health. In contrast to this attack on "disease in the mass," the approach to the individual has been almost entirely within therapeutic confines and in the hands of the private medical practitioner.

There is available a wide sphere of preventive measures, however, which are applicable to the individual, encompassed under (b) and (c) above. While knowledge of preventive medicine is still really in its infancy, the significant fact is that much less is applied

—especially in way of early diagnosis—than is known even now. It is the purpose of this paper to take inventory of these known preventive measures with a rough estimate of what their cost would be as part of an organized group medical service.

In the all-important purpose of organizing systems of pooled prepayment for medical services, too often scant consideration has been given to preventive measures. America's largest voluntary prepayment undertakings, the Blue Cross hospitalization program and the Farm Security Administration rehabilitation health program, are cases in point. Pending legislation calling for the inclusion of health services under social insurance makes little special provision for preventive services to the individual.

A fuller appreciation of the practical applications of these preventive services to the individual may help to assure their inclusion in any program of organized medical services, whether on a voluntary or a compulsory basis, developed in the post-war period. This is, of course, not to minimize in the slightest the importance of expanding at the same time the environmental level of prevention, traditionally the province of public health. The changing picture of disease, however, with increased importance attaching to the degenerative diseases of later years—not preventable by known measures of environmental control—heightens the need for a preventive approach geared to early detection of conditions in the individual.

COSTS AND ORGANIZATION

The cost of preventive services to the individual depends on a number of conditions. Much depends on the availability of services from an organized unit of some type, as distinguished from services rendered by independent practitioners. It probably may be stated that greater economy is achieved, the less the provision of services is characterized by a system of individual practice with fee-for-service payment to the physician and the more it approaches a system of "health center" practice with salaried personnel.

A computation of costs might be made for these two ends of the range and for several steps in between. For the sake of simplicity of presentation, however, and as a sound basis for post-war planning, it may be permissible to conceive of all health services to the individual—preventive as well as therapeutic—rendered under a single organized administration. The very availability of such a program of preventive services as suggested here would necessarily assume a high degree of community organization of medical services, one considerably beyond the conventional limitations of the present department of health. It would be reasonable, therefore, to estimate costs on the assumption of a system with physicians on salary and with accessory and overhead costs reduced by the economy of a "health center" form of operation.

The hypothetical program accordingly would call for periodic visits to the "health center," where one or more procedures would be performed, directed toward the prevention or early detection of the commonest diseases in the age and sex group of the particular individual. The unit-costs stipulated for services take into account the economies which would be enjoyed by synchronized handling of a large volume of services. A twenty-one year old young lady, for example, making her periodic visit, would receive not only her "selective" physical examination but also a chest x-ray, a serological test, a hemoglobin determination, and a dental examination at the same time. The actual unit-cost of each of the five procedures, therefore, can be much less than if each were carried out as an independent operation at a separate time.

For the sake of simplicity in computing costs, it will be assumed that we are dealing with a community of 1,000 persons, distributed according to the age composition of the United States in 1940.⁴ To

⁴ Under 1 year (births)	18	15 - 19 years	94
1 - 4 years	62	20 - 24 years	88
5 - 9 years	81	25 - 29 years	84
10 - 14 years	90	30 - 34 years	78

(Continued on page 213)

simplify the cost estimates for professional services, they will be computed on the assumption of a \$5,000 a year average physician's salary and a \$2,000 a year average technician's salary. Assuming about 2,000 hours of work per year (40-hour week) the per-hour cost of services would be \$2.50 and \$1.00 respectively. Other expenses will be computed on the basis of estimated current overhead costs for clinic or laboratory operations.

The soundest execution of such a preventive program would call for close integration with the provision of therapeutic medical services, involving the same personnel and facilities. It would be foolish, of course, to provide an elaborate system for the early diagnosis of major disease problems without having assurance that treatment is available. Not only is integration of preventive and therapeutic services thoroughly reasonable for the benefit of the patient, but it is administratively more efficient and economical. The administrative mechanisms for operating such a combined health program, however, would require a separate detailed discussion.

With these qualifications in mind, we may examine the content of an organized program offering a relatively complete gamut of preventive services to the individual. A summary of costs and the factors in their computation is indicated in Table 1.

I. MATERNITY

The most firmly established preventive procedures in current medical practice involve maternal and infant hygiene. Their basic importance in any program is evident, though too often they represent the entire extent of preventive practice.

Generally accepted recommendations stipulate prenatal visits to

35 - 39 years	73	60 - 64 years	36
40 - 44 years	67	65 - 69 years	29
45 - 49 years	62		
		70 - 74 years	19
50 - 54 years	55	Over 75 years	20
55 - 59 years	44	Total	1,000

(Derived from U. S. Bureau of the Census, *Population Series*, 1940)

SERVICE	NUMBER PERSONS SERVED	SERVICES PER PERSON PER YEAR	TOTAL SERVICES	COST PER SERVICE	TOTAL COST
<i>Prenatal Care</i>					
Live Births	18	13	234	\$1.00	\$234.00
Other Pregnancies	5	5	25	1.00	25.00
<i>Postpartum Care</i>	20	3	60	.90	54.00
<i>Child Hygiene</i>					
First Year	18	12	216	1.25	270.00
Second Year	16	4	64	1.25	80.00
Third to Fifth Years	46	2	92	1.25	115.00
<i>Immunizations</i>					
Routine (first year)	18	7	126	.40	50.40
Routine (fifth year)	16	2	32	.40	12.80
Measles	4	1	4	2.00	8.00
Rabies	1	1	1	10.00	10.00
Typhoid Group	100	3	300	.20	60.00
<i>Laboratory Procedures</i>					
Chest X-Rays	417	1	417	.50	208.50
Serological Tests	344	1	344	.25	86.00
Urinalyses (partial)	202	1	202	.10	20.20
Urinalyses (complete)	203	1	203	.20	40.60
Hemoglobins	304	1	304	.25	76.00
Gastric Analyses	100	1	100	.75	75.00
Electrocardiograms	292	0.5	146	1.50	219.00
<i>Dental Examinations</i>	900	1	900	1.35	1,215.00
<i>Specialist Procedures</i>					
Fluoroscopies	130	1	130	.50	65.00
Sigmoidoscopies	100	1	100	1.50	150.00
Gynecological Exams.	308	1	308	—	—
Visual Tests	300	0.3	90	—	—
<i>Periodic Health Exams.</i>					
5-19 Years	265	1	265	1.25	331.25
20-34 Years	250	0.5	125	2.00	250.00
35-49 Years	202	1	202	2.50	505.00
50 Years and Over	203	2	406	3.00	1,218.00
<i>Geographic Problems</i>					
Malaria Blood Smears	171	1	171	0.50	85.50
Stools for Hookworm	171	1	171	0.40	68.40
ALL SERVICES (Except Geographic)	—	—	5,396	1.00	5,378.75

Table 1. Proposed preventive services and costs per year for a standard community of 1,000.

a physician from the outset of pregnancy. For the first seven months visits should be made monthly; for the eighth month twice monthly; and for the ninth month weekly. An additional 25 per cent of pregnancies may be presumed to occur which would not carry through to a live issue. Assuming termination of these pregnancies after varying periods of gestation, from early abortions to full-term stillbirths, an average of five months of care may be estimated. With weighing, blood pressure determination, and urinalysis being handled by technical aides, an average of 15 minutes of the physician's time would be required per visit.

Generally accepted standards stipulate at least three postpartum visits at six weeks, three months, and six months after delivery. Somewhat less of the physician's time and fewer attendants' services would be required.

II. INFANT AND CHILD HYGIENE

The American Academy of Pediatrics recommends "well-child conferences" as follows: a monthly examination during the first year, an examination every three months during the second year, and an examination every six months during the third, fourth, and fifth years. Each visit would require about 20 minutes of the physician's time.

It is understood, of course, that the periodic conference on the infant or child includes more than a physical examination. Detailed counseling of the parent during the examination on nutrition, bowel habits, behavior problems, and all matters relevant to the child's health would be furnished.

III. IMMUNIZATIONS—ROUTINE AND SPECIAL

Routine. Applying only generally accepted procedures for the average American community, the immunizations which may be considered essential for all persons are smallpox vaccination, administration of alum-precipitated diphtheria toxoid, combined with tetanus toxoid (two injections), and pertussis immunization (four

injections). All seven injections should properly be given in the first year of life. At five years of age, an additional "booster" injection each of the combined diphtheria-tetanus toxoid and smallpox vaccine should be given. When given in conjunction with the periodic medical examinations, the average cost should not exceed about \$0.40 per injection, including the cost of equipment and biologicals.⁸

Special. Certain special immunizations should be made available to particularly exposed segments of the community.

All children exposed to measles while under five years of age (when the case fatality and complication rates are highest) should receive immune measles serum. Since about 50 per cent of all cases occur before the fifth year and since the ultimate incidence of the disease is nearly 100 per cent, about half of all children under five years of age would require administration of the immune serum, if the exposure were known. Definite exposure might be assumed to be recognized in 50 per cent of these cases.

Rabies, while a rare hazard, may be assumed to be a matter of concern for about one person per year in our community of 1,000. That is, one bite per year by a rabid animal might be assumed to require the Pasteur treatment.

About 10 per cent of the population may, perhaps, be considered exposed to typhoid fever, paratyphoid fever, or dysentery because of familial contacts with cases, travelling, or other epidemiological relationships. This group would require immunization with "triple typhoid" vaccine.

It is to be noted that no plan is considered for the performance of preliminary Schick tests for diphtheria, since all children would be given the toxoid, nor for Dick tests, since scarlet fever immunization is not as yet generally considered effective.

No account is taken, furthermore, of those over-age persons who

⁸ The cost of the material, per injection, for combined diphtheria-tetanus immunization, when purchased in quantity, is under 20 cents. For pertussis, it is about the same and for smallpox it is about 5 cents.

have not previously received the essential immunizations. For the sake of simplicity, it is assumed here that the preventive program would start with the present population and not attempt to correct all the omissions of the past. If the latter were to be done, initial costs in the first few years would, of course, be higher, but after a transition period, the cost pattern would approach that described here.

IV. SPECIAL CASE-FINDING LABORATORY PROCEDURES

The special value of certain diagnostic laboratory tests in a large-scale preventive program is that through them many pathological cases may be "screened out" in early stages without initially requiring the time of a physician for more than the interpretation of findings. Through such tests the "neglected" adult may be given some of the benefits of preventive medicine. An evaluation of the full meaning of individual cases with positive laboratory findings would, of course, require combined study of clinical and laboratory data. Case-finding laboratory procedures would be advisable on particular age and sex groups as follows:

Chest X-Rays—for the early detection of pulmonary tuberculosis (still the major cause of death in early adulthood) and other conditions of the lungs, heart, or mediastinum. These examinations should be performed on both sexes of the age group 15 to 40 years of age. For this type of mass examination, the photofluorographic method would be feasible, using miniature films. Taking into account the cost of this equipment (amortized over a number of years) as well as the film and the cost of roentgenological interpretation, the cost per case should not exceed about \$0.50.

Serological Tests—for the detection of syphilis. In a full-blown preventive program, we would be concerned naturally only with the detection of new cases. Yearly serological tests, therefore, should be done on the 15 to 35 year age group, when the vast majority of new cases occur and on all women during pregnancy. In practice, of course, modifications in testing routines would be made in recognition of varying likelihoods of venereal exposure. Thus, married persons, after pre-

marital examination, might be tested only every two years, while certain racial or socio-economic groups might be tested more often than annually. Using a rapid slide flocculation technique as a screening measure, the cost per test should not exceed \$0.25.

Urinalyses—for the early detection of diabetes mellitus, a disease of clearly increasing prevalence, and a variety of conditions of the genitourinary tract, including possibly tumors of the kidney. For the age group 35 to 50 years, a test only for albumin and glucose would probably be adequate to disclose most pathological cases and should be done once a year. A technician with equipment for multiple tests could easily do thirty such tests per hour.

For the age group 50 years and over, however, the annual urinalysis should include a microscopic examination as well, to give a more refined index of urogenital tract pathology in the years when it is of highest incidence. This more thorough examination would cost somewhat more.

Hemoglobin Determinations—to be used as a screen test for the detection of anemias of primary or secondary type and indirectly certain other blood dyscrasias. It would be indicated particularly in women in the 15 to 55 year age group, once a year.

Gastric Analyses—for the early detection of carcinoma of the stomach or precancerous achlorhydria, peptic ulcers, pernicious anemia, etc. It would be indicated in males 50 years of age and over, once a year. As a simple screen test, it would not be necessary to take more than a single fasting specimen. This procedure, which can be handled entirely by a technician, should take no more than twenty minutes including collection of the sample and chemical testing.

Electrocardiograms—for the early detection of probably the most common single cause of death in the United States today, arteriosclerotic heart disease. Certain other types of heart disease might also be detected. These tests should be performed on all persons of both sexes between 40 and 70 years once every two years. Using only two of the conventional "leads" as a screening procedure (leads I and III), the test would require about thirty minutes of technician's time and ten minutes of physician's time for interpretation.

It is noted that all these diagnostic laboratory tests are to be used as screening procedures and no account is taken of the need for

careful follow-up of cases giving positive results. The performance of follow-up examinations should be considered a phase of individual diagnosis and therapy.

New simple diagnostic tests are, of course, being developed all the time. A whole gamut of laboratory tests for subclinical nutritional failure, for example, is available including determinations of blood ascorbic acid (vitamin C), prothrombin time (vitamin K), blood calcium, plasma proteins, etc. Whether or not such examinations on a mass scale would give practical information not obtainable by physical examination, however, is not now clear. Obviously, the indicated laboratory tests in a preventive program will change with advancing knowledge.

V. DENTAL EXAMINATIONS

It is very difficult to draw the line between preventive and therapeutic procedures in dentistry. For the purpose of this program, however, the preventive procedures may be considered to include the examination of the mouth for oral disease and the administration of a prophylactic or cleansing process. The actual repair of dental defects, while ultimately preventive, would not be within this conception.

On this basis all persons three years of age and over should have a dental examination (including the prophylaxis) once a year. Dentists estimate that about 25 per cent of the persons past 50 years of age, however, are completely edentulous or should be so rendered, so that they would not require any further preventive dental care. (This percentage would naturally decline as the program developed). The dental prophylaxis may be done by an oral hygienist, requiring about thirty minutes, while the examination would consume about fifteen minutes of dentist's time. Assuming a dentist's hour valued at \$2.00 (\$4,000.00 annual salary), a hygienist's hour valued at \$1.00, and accounting for accessory costs (including occasional x-rays), the cost per examination would amount to about

\$1.35. Examinations would, of course, almost invariably disclose defects, so that ultimate expenditures for dental therapy would be considerable, though they would decline through the years.

The preventive value of early correction of dental defects should be kept in mind not only in connection with oral well-being but particularly in relation to certain systemic disorders of later years, such as arthritis, neuritis, headache, eye or ear infection, osteomyelitis, endocarditis, or other infectious processes.

VI. SPECIALIST DIAGNOSTIC PROCEDURES

Certain other case-finding procedures of value would require a physician or technical specialist for their actual performance as well as for the interpretation of results.

Chest Fluoroscopies—for the detection of certain chest tumors and cardiac abnormalities early in their onset. It is generally recognized that carcinoma of the lung is on the increase, particularly in males, for reasons that are not clear. If research discloses that a factor such as the inhaled tar products of tobacco are causative, other preventive measures would, of course, be indicated. Males, 40 to 65 years of age, would have one examination per year.

Sigmoidoscopies—for the detection of cancer of the descending colon, precancerous polyps, diverticula, colitis, and other disturbing or potentially serious conditions. They would probably be indicated chiefly in males past 50 once a year. About twenty minutes of physician's time would be required for an adequate examination.

Gynecological Examinations—including use of the vaginal speculum. Since this can be performed by the general examining physician, it is given consideration under the periodic health examination below for women 20 to 69 years of age.

Visual Acuity Tests—the use of the Snellen chart and simple tests for close reading and astigmatism should be applied in the school years (5-14) to detect congenital disorders of vision and again from 40-49 years when visual changes of aging begin to set in. During each of these ten-year spans three examinations would be adequate. Since these examinations can be performed by the general examining physician or

even by a nurse or assistant, they also are considered below. Once visual disorders are detected, their subsequent correction and follow-up would not be part of the preventive program.

VII. PERIODIC HEALTH EXAMINATION AND COUNSEL

The keystone of the entire preventive program, around which most of the above procedures are built, is the periodic examination of the presumably normal individual. From the public health point of view, the difficulty with the usual periodic health examination is that it has not been selective in its approach. The minute detail which may be permissible to the private physician dealing with an isolated individual need not be required in a broadly organized community program. From the public health point of view, the periodic examinations may be systematized according to the age, sex, occupational status, income level, race, and the geographical location of the persons involved. By seeking only the signs of those disorders which are highly prevalent in the particular demographic group, periodic examinations might be quite practicable on a vast scale.

It is important to realize that an adequate health examination should include a selective medical history as well. A few well-directed questions are worth more than much chest-thumping.

Positive counseling on dietary habits, sleep, exercise, and mental hygiene is part of the process. The personal advice of the physician on the importance of a well-balanced diet can accomplish more than many posters and pamphlets. The alert physician may detect cases of emotional disorder which might be referred for psychiatric attention.

The performance of the medical examination would, of course, be integrated with the several special diagnostic tests dealt with above. The significant disorders to be sought for clinically would be those not detected by one of the special case-finding procedures already described.

As for the time of the periodic examination, it need not be at strictly six, twelve, or twenty-four month intervals. A visit by the patient for a particular ailment could provide the occasion for his thorough check-up, though it might be a month or two ahead of time. Attendance by the same physician for illness and for preventive work would, of course, eliminate duplication of effort and save time. It should promote, furthermore, the intimate relationship essential to good medical practice and especially to good mental hygiene service.

*School Child and Adolescent (5-19 years).** The specific conditions, not already covered by other examinations, that are to be investigated in this group would include particularly: enlarged tonsils and adenoids, symptoms of rheumatic fever, middle ear infections, poor posture, weak arches, and skin diseases like acne or epidermophytosis. Vision should be tested, as indicated under Section VI. Allergic phenomena, like hay fever or urticaria, should be investigated and adolescent sex hygiene should be given some attention. Dietary habits are important in this group. One examination a year should be performed, requiring about twenty minutes.

It is realized that conventional school hygiene today regards about three examinations in school life as ample. This policy is dictated, however, by current inadequacies in medical personnel, facilities, and organization, in a setting where diagnosis is sharply separated from therapy and where patient counseling on living habits, diet, or mental hygiene plays little, if any, part at all. The optimal management of the school child and adolescent would require an examination at least annually.

Young Adult (20-34 years). In this age group, beyond the conditions covered by other procedures, particular attention would be given to symptoms or signs of peptic ulcer, inguinal hernia, chronic recurrent appendicitis, or genital infection. In women, a pelvic examination should be performed and special attention should be

*The examination of the child under 5 years has been considered above.

given to menstrual disorders, obstetrical problems, and to thyroid disorders. Among industrial workers, evidence of occupational exposure to important hazards, such as lead, silica, or benzol, would be considered. Living and sleeping habits and general emotional status would be investigated. The relatively robust persons in this age group need be examined only once every two years,⁷ requiring about thirty minutes per examination.

Middle Age (35-49 years). In this age group, in addition to procedures already mentioned, blood pressure readings would be routinely taken to detect hypertension. Obesity would be given careful consideration in the light of its predisposing role in the development of hypertension, diabetes, or gall bladder disease. Mechanical disorders, such as hernia, varicose veins, or hemorrhoids would begin to take on importance. In women a gynecological examination would again be performed in which evidence of pelvic collapse, fibromyoma uteri, cervicitis, or genital carcinoma would be sought; menopausal symptoms, as well as possible psychoneurosis or the gall bladder disease of the "fair, fat, and forty" should be investigated. In men a rectal examination should be performed and a history taken for the urinary symptoms associated with early prostatic hypertrophy. Ocular disorders and rheumatoid arthritis are other major problems occurring in this age group. This group should be examined once a year, requiring an average of forty minutes for this somewhat more thorough examination.

Older Years (50 years and over). In this age group the cardiovascular system should be examined in detail both by physical appraisal and history. A history of gastro-intestinal functions should be taken with regard to "dyspepsia," bowel habits, or other points premonitory of early cancer or other disorders. Up to 70 years of age, pelvic examinations should be performed in women for neoplasm and rectal examinations in men, for prostatic or rectal disease.

⁷ It is to be noted, however, that chest x-rays for tuberculosis, serologic tests for syphilis, and dental routines are to be performed annually.

Diet should be considered in relation to obesity or vitamin deficiency. Hernia, varicose veins, arthritis, and bronchial asthma are common problems. For the first time an ophthalmoscopic examination should be performed for fundus signs of arteriosclerosis as well as for cataract. A brief neurological examination eliciting reflexes and vibratory sensation should be performed. To make any inroads on the two greatest killers, heart disease and cancer, the examination in this age group should be performed twice a year, requiring about fifty minutes for the relatively thorough study.

It is to be noted that the frequency and thoroughness of the periodic examinations would be adjusted to the incidence of disorders for each age group. Thus, while an examination at two-year intervals is probably adequate for the 20-34 year age group with its relatively low disease incidence, a six-month interval would probably be necessary to provide early diagnosis of the insidious and frequently fatal disorders striking after 50. At other ages, except in the pre-school child, annual examinations are probably adequate.

Admittedly the average American and equally so the contemporary medical practitioner are not adjusted to the deeply preventive concept implicit in a periodic examination associated with counselling on ways to positive health. Undoubtedly, much health education of patients and reoriented training of physicians would be necessary. But this reflects the very purpose of this presentation. Visualization of a thorough-going preventive program at which to aim may provide some inducement for the needed public education and professional training. Changes in actual medical practice at the same time will inevitably summon changes in attitudes.

VIII. HEALTH PROBLEMS IN SPECIAL GEOGRAPHIC AREAS

In certain geographic areas where particular diseases are highly prevalent, additional case-finding procedures would be carried out in the individual, supplementing established measures of environmental control.

In malarial regions, for example, blood smear examinations on all school children (5-14 years) might be performed once a year. In hookworm areas, stool examinations for ova might likewise be performed on school children annually. In certain fairly well-defined regions, immunizations on selectively exposed portions of the population would be indicated, such as for equine encephalomyelitis, Rocky Mountain spotted fever, or possibly typhus fever or tularemia.

SUMMARY AND DISCUSSION

A schematization of the proposed preventive program according to the age and sex groups involved is presented in Figure 1.

It is to be noted from Table I that this relatively ambitious program, if organized on the basis stipulated, would cost annually less than \$5.40 per capita. The average cost per service would be slightly more than one dollar. On a purely private fee-for-service basis of provision and payment, the cost would, of course, be considerably higher. This is to be compared, nevertheless, with the well-known Committee on the Costs of Medical Care estimate of \$30 per capita annual expenditure for medical care in the United States, as of about 1930. The ultimate economic savings of the "ounce of prevention" need hardly be suggested and the benefits in way of positive health and human welfare would defy measurement.

It is realized fully, of course, that the entire program is hypothetical. The presentation is made, however, in the interest of establishing the principle of selective procedures, adjusted to particular demographic groups, as a practical approach to the problem of preventive services to the individual in an organized medical care program. Actually, the organization of services in practice should come to be based on factors beyond simply age, sex, and geographical location. Realistically, income level, race, and occupation should also play a part, with respect to the anticipated incidence of particular diseases.

SERVICE	AGE GROUP IN YEARS																
	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75+	
MATERNITY				F	F	F	F	F	F								
IMMUNIZATION (ROUTINE)	X																
IMMUNIZATION (SPECIAL)	S	S	S	S	S	S	S	S	S	S	S	S					
INFANT AND CHILD HYGIENE	X																
HEALTH EXAMINATION		A	A	A	A	A	A	A	A	A	T	T	T	T	T	T	
CHEST X-RAY					A	A	A	A	A								
SEROLOGY					A	A	A	A									
URINALYSIS									A	A	A	A	A	A	A	A	
HEMOGLOBIN					F	F	F	F	F	F							
GASTRIC ANALYSIS																	
ELECTROCARDIOGRAM										F	F	F	F	F	F	F	
CHEST FLUOROSCOPY											F	F	F	F	F	F	
SIGMOIDOSCOPY												F	F	F	F	F	
VISION		S	S							A							
OPHTHALMOSCOPY												A	A	A	A	A	
BLOOD PRESSURE												A	A	A	A	A	
GYNCOLOGICAL EXAMINATION					F	F	F	F	F	F	F	F	F	F	F	F	
DENTAL EXAMINATION	S	A	A	A	A	A	A	A	A	A	A	A	A	A	A	S	
GEOGRAPHIC PROBLEMS		S	S														

A - ALL PERSONS, ANNUALLY
F - FEMALES ONLY, ANNUALLY
M - MALES ONLY, ANNUALLY
X - ALL PERSONS AT INTERVALS DESCRIBED IN THE TEXT

B - BIENNIALY, ALL PERSONS
T - TWICE YEARLY, ALL PERSONS
S - SOME PERSONS EACH YEAR

Fig. 1. Proposed preventive services according to age and sex groups and frequency of performance.

It goes without saying that criticism of the technical details presented here is expected. Innumerable local adjustments, moreover, would be required in actually executing such a program. It is hoped, however, that consideration of this theoretical plan might provide a basis for discussion from which might stem practical modifications, based upon new knowledge and experience.

AN EXPERIMENT IN NUTRITION TEACHING BY PUBLIC HEALTH NURSES¹

JEAN DOWNES AND ANNE BARANOVSKY

THE promotion of better nutrition through instruction concerning the nutritional needs for the maintenance of good health is a legitimate part of the public health program and a proper function of public health nursing. The nurse, because of her close contact with families where there are health problems, has an unusual opportunity to emphasize the value of a good diet as a preventive measure.

This report describes an experiment in nutrition teaching conducted by public health nurses in sixty Negro families in 1943. These families were living in Area 8 of Upper Harlem in New York City and were under public health supervision because of familial exposure to infectious tuberculosis.

Because of a special program for control of tuberculosis in Area 8 of Upper Harlem, all of the tuberculous families in that area have been visited at fairly frequent intervals for public health supervision since April, 1939.² Detailed records about the social and economic condition of each family were obtained and changes in these conditions were noted. Data of food habits have been obtained also, and general nutrition teaching has been a part of the nursing supervision since 1939. Due to the nurses' teaching, and possibly also to increases in income, there had been some improvement in dietary patterns previous to the beginning of the experiment reported upon here (1,2).³

¹ From the Community Service Society, the Milbank Memorial Fund, and the New York City Department of Health.

² Dr. Herbert R. Edwards, director of the Bureau of Tuberculosis, is medical director of the special study program. The medical staff of the Tuberculosis Clinic was provided by the Department of Health. The nursing and clerical staffs of the Tuberculosis Clinic were provided by the Department of Health after December 1, 1941; until then, they were provided by the Community Service Society. The home visiting, which included the nutrition teaching described in this report, was done by five staff nurses of the Community Service Society under the supervision of Miss Jean South, R.N.

³ In a study of changes in income and food expenditures among tuberculous families in
(Continued on page 228)

METHOD OF SAMPLING AND PLAN OF STUDY

The original sample consisted of seventy-three families drawn at random from a list of tuberculous families under supervision in March, 1943 in Area 8 of Upper Harlem. At that time only about one-third of the families had had public health nursing supervision less than one year. The sample was limited in size so that the nurses would feel free to make frequent visits to the family for teaching nutrition if it were thought necessary to do so. During the course of the study a total of thirteen families, or about 18 per cent, had to be dropped from the original sample for the following reasons: five moved and could not be located; five families were broken because of tuberculosis and the family members were living in various parts of the City; in two two-person families the wife was hospitalized and the husband was obtaining meals away from home; and for one family, nursing visits were discontinued at the request of the private physician who was in charge of the tuberculosis case in the family.

A food schedule was used to record for a seven-day period the family's habits of consumption of the types of food which are principal sources of the essential nutrients for a well-balanced diet. The amount of money spent for food in the same seven-day period was also recorded. These records were obtained from each family at monthly intervals and nutrition instruction was carried on for a period of three months, April to June, 1943. At the end of this period of special teaching, visiting in the families in the study was discontinued, except for emergencies, until October, when monthly visiting with special teaching was resumed for another three-month period. Thus, all families had the opportunity to have six months of special instruction in food habits.

The seven-day report on the use of different foods was designed

Harlem it was found that the mean average annual income in January, 1943 was 85 per cent above the mean income for 1940. The mean weekly expenditure for food increased 53 per cent in the same time period. The amount of money necessary for an estimated minimum-cost diet increased approximately 44 per cent.

to describe qualitative food habits of the family. The housewife was asked to give information as to the amount or frequency of use of specific foods during the seven-day period preceding the visit. The information for each type of food was as follows:

1. The amount of milk
2. The amount and kind of cheese
3. The number of eggs
4. The amount of butter or oleomargarine
5. Citrus fruits, times used
6. Tomatoes, times used
7. Other fruits, times used
8. Potatoes (white), times used
9. Vegetables, times used for each kind
10. Lean meat, poultry, or fish, kinds and times used
11. Dried beans or peas, times used
12. Bread and cereals, times used for each kind

As soon as a food schedule was obtained from the family the data for each food group were rated according to the following scale: "standard or above," "slightly below standard," "marginal," and "unsatisfactory." Thus, the nurse had a guide as to where greatest emphasis was needed in the nutrition teaching in each family. Also, a nutritionist, experienced in nutrition teaching, acted as a consultant for the special study and gave assistance on any problems brought to her by the nurses.*

In April, 1944, one year after the start of the special teaching study, the families were visited again in order to obtain data on food habits at that time. It is possible, therefore, to study changes in the family food habits at two periods: (1) after three months of teaching with a three-months' rest period from teaching; and (2) after

* This rating was based on the standards recommended by the Food and Nutrition Board of the National Research Council. See Appendix 2.

* Mrs. Irene Fitzgerald, of the Nutrition Division of the Community Service Society, acted as consultant for the study. Miss Lucy Gillett, at that time director of the Nutrition Division, also gave valuable advice in the planning of the teaching study.

two three-month periods of teaching each followed by a three-month rest period from teaching. The three-month rest period from teaching was considered important in judging the effectiveness of teaching, because in that interval it was thought that the family might revert to old or usual food habits if the teaching had not been effective.

In an appraisal of the effectiveness of the nutrition teaching done by the nurses, it should be pointed out that the food schedules do not provide completely objective data independent of factors which may affect their validity for purposes of measurement. They are simply records containing information concerning the food habits of the family obtained by the public health nurse from the housewife. After teaching about any subject that includes putting into practice what is learned as the final test of learning, there is always difficulty in evaluation of the effectiveness of teaching unless practice is observed. In this special teaching study the food habits of the family were not observed after instructions concerning them were given, and the reports obtained by the nurses provide the only criteria available for judging the success of their teaching.

DESCRIPTION OF THE FAMILIES

Before the data on the use of different foods and the content and effect of the nutrition teaching are discussed, it will be of interest to describe certain characteristics of the families in the study. The housewife is usually the one responsible for the selection of the family food supply and it has been found that there is a relationship between the age of the housewife and the dietary pattern of the family. In a study of food habits of 943 white families living in the Eastern Health District of Baltimore, the best diets were recorded for families where the housewife was under 40 years of age and the poorest diets were those for families where the housewife was 60 years of age and over (3).

The distribution of the families according to the age of the house-

AGE OF HOUSEWIFE	PER CENT	NUMBER OF FAMILIES
TOTAL	100.0	60
Under 20 Years	0	0
20-24 Years	8.3	5
25-29 Years	10.0	6
30-34 Years	21.7	13
35-39 Years	15.0	9
40-44 Years	18.3	11
45-49 Years	11.7	7
50-59 Years	11.7	7
60 Years and Over	3.3	2

Table 1. Distribution of families according to age of housewife, Upper Harlem Area of New York City.

wife is shown in Table 1. In 55 per cent, the housewife was under 40 years of age; in 30 per cent, she was from 40 to 49 years of age; and in 15 per cent, she was 50 years of age or older. On the whole, the housewives in this study were relatively young. A considerable number of the families were of moderate or of small size. There were from two to four persons, only, in 78 per cent of the families, more than four persons in 17 per cent of the families, and only one person in 5 per cent of the families.*

Table 2 shows the distribution of the families according to their main source of income during the period April to June. The chief source of income for the majority of families, or 62 per cent, was earnings. Some of these families had other income in addition to earnings. "Other income" included rent from lodgers, Army service allotments, insurance, and contributions from relatives. For families receiving their income mainly through public assistance, the most usual sources were the Bureau of Home Relief and the Bureau of Child Welfare. Some of the families in this group also had "other income" in addition to public assistance.

* Lodgers have not been considered as a part of the family. Fifteen families, or 25 per cent, kept lodgers.

MAIN SOURCE OF INCOME	PER CENT OF FAMILIES	NUMBER OF FAMILIES
TOTAL	100.0	60
Earnings	61.6	37
Public Assistance:		
Home Relief	20.0	12
Bureau of Child Welfare	11.7	7
Old-Age Assistance	3.3	2
Community Service Society	1.7	1
Work Relief	1.7	1

Table 2. Distribution of families according to their main source of income, Upper Harlem Area of New York City, April to June, 1943.

The income of families depending upon public assistance was generally less than the income reported by families where income was derived from earnings and other nonrelief sources. Consequently, income is shown for two groups of families, those where the source of income was chiefly earnings and those who received some public assistance. Table 3 presents the average annual income per cost unit in the two groups of families during the two periods

Table 3. Average annual income of families classified according to main source of income during two three-month periods, Upper Harlem Area of New York City.

PERIOD OF TIME AND MAIN SOURCE OF INCOME	MEAN AVERAGE ANNUAL INCOME PER COST UNIT ¹	STANDARD DEVIATION σ	NUMBER OF FAMILIES ²
<i>April-June, 1943</i>			
Earnings	\$ 886 \pm 78.7	424.18	29
Public Assistance ³	426 \pm 23.7	105.85	20
<i>October-December, 1943</i>			
Earnings	1,034 \pm 96.1	518.06	29
Public Assistance ³	575 \pm 52.4	122.08	18

¹ Some families whose main source of income was through public assistance also had some income from other sources.

² Income is expressed in cost units because this method allows for the relative cost of maintenance of children and adults.

³ Excluding families where amount of income is unknown.

of nutrition teaching.⁷ In the period April to June, the mean average annual income for families with no public assistance was \$886 per cost unit, compared with \$426 in those receiving public assistance. In the second period, there was an increase of 17 per cent in income for the former group and 35 per cent for the latter group of families.⁸

The question may be raised as to whether or not the families were spending enough money for food to provide an adequate diet. A comparison of the average weekly food expenditure per cost unit in April with the minimum amount estimated as necessary at that time, is presented in Table 4. On the average, families of the same size were spending more than the minimum amount estimated as

Table 4. Average expenditure for food in families classified according to size of family, compared with an average minimum expenditure estimated as necessary to obtain a good diet, Upper Harlem Area of New York City, April, 1943.

SIZE OF FAMILY IN ADULT COST UNITS	AVERAGE EXPENDITURE FOR FOOD PER WEEK PER COST UNIT	ESTIMATED MINIMUM COST FOR FOOD PER COST UNIT PER WEEK ¹	NUMBER OF FAMILIES
<i>One Person</i> (0.85-1.00)	\$4.71	\$4.05	1
<i>Two Persons</i> Two Adults or One Adult and One Child ¹ (1.39-2.21)	5.06	3.90	17
<i>Three Persons or More</i> (2.36-2.96)	4.66	3.30	24
(3.03 and Over)	4.44	3.10	17

¹ In a few instances, family includes one adult and two small children.

² The standard for the amount of money needed for food expenditure was obtained from the Table of Food Allowances, which is a part of the Schedule for Planning Budgets, issued by The Community Service Society for use by members of its staff. The Schedule for Planning Budgets is issued at intervals and takes account of changes in the cost of food and other items of living which are a part of the family budget. The Table of Allowances, dated January, 1943, was the one used as a standard for the data in this table.

In computing the average weekly amount of money needed for food, account was taken of the food requirements, by sex, of adults and of children of different ages.

These estimates are for normal conditions and are not those of families needing extra nourishment.

⁷ Cost units were estimated by use of a food cost scale (per man, per day basis) which allows for the relative cost of maintenance of children and adults.

⁸ In a previous report on a study of changes in income and food expenditures among tuberculous families in Harlem (2), the average annual income in the period December, 1942 to January, 1943, was estimated as \$662 per cost unit. The average weekly food expenditure per cost unit was found to be \$4.38 in January, 1943.

necessary for a diet of good quality. However, the expenditure of sufficient money for food does not necessarily mean that the diet will be a good one. A study of food habits of tuberculous families in Harlem in 1941 showed that in families where the food expenditures were equal to or more than the estimated amount necessary, 45 per cent had food habits which were considered as moderately or considerably below the recommended allowances (1). To obtain a good diet at minimum cost, knowledge of food values, of food requirements, and of proper preparation of foods to preserve nutritive values is essential. Careful management of the family budget and planned shopping for food are also required to obtain well-balanced meals for the family. These points were emphasized in the nurses' nutrition teaching.

FREQUENCY IN USE OF SPECIFIC FOODS

The reported frequencies in the use of specific food groups are presented for three weekly periods. The first period was in April, 1943, before special nutrition teaching had been started, the second period was in October, or six months later, and the third period was in April, 1944, a year after special teaching was started. These data are shown in Figures 1 and 2 and in the table in Appendix 1.

Milk. In the week before the first visit for special nutrition teaching, a high proportion of the families, or 88 per cent, reported using 3.5 quarts of milk or more per person per week. Only seven families, or 12 per cent of the total, used less than this amount. The high consumption of milk in these families, compared with surveys of other families, may be attributed to the fact that the use of milk in the diet has been constantly emphasized by the nurses in their supervision of tuberculous families.*

There was a considerable increase in the use of milk in April, 1944, or a year after special teaching was started. Only one family reported a use of milk which did not meet the standard allowance,

* In 318 white families (housewife under 40 years of age) in the Eastern Health District of Baltimore, 58 per cent reported that they used less than 3.5 quarts of milk per person per week.

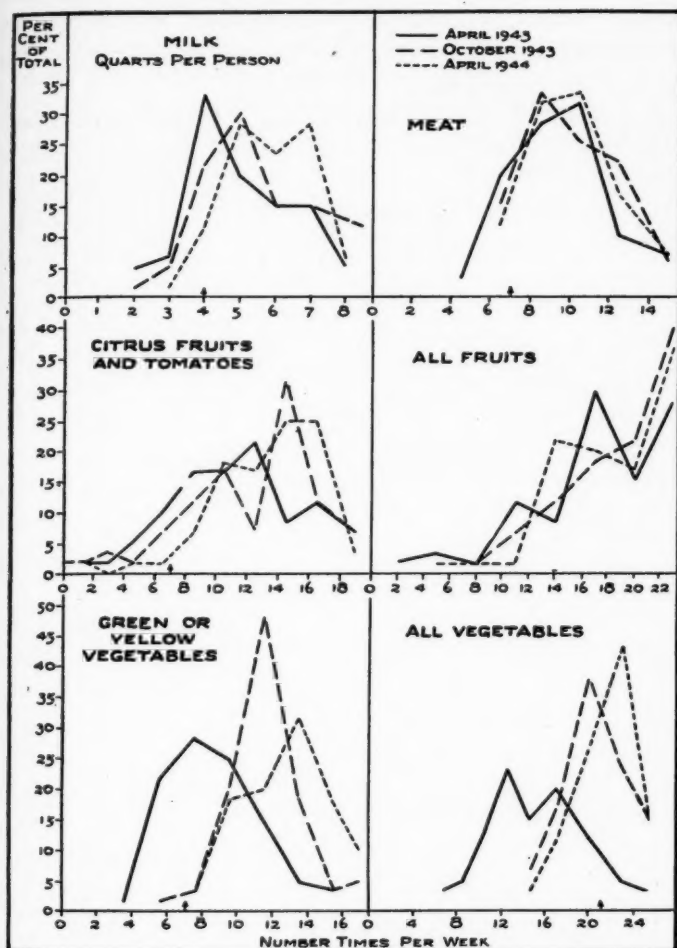


Fig. 1. Percentage distribution of diet records for sixty families in an area of Upper Harlem, New York City, according to the reported use of specific foods or food groups during one week in April and in October, 1943 and in April, 1944. (The arrow indicates the frequency of use which approximately corresponds to that in the recommended dietary pattern.) (For "all fruits" the arrow should be at 14 times per week.)

that is, less than 3.5 quarts per person per week. A large majority of the families, or 80 per cent, used between 4.5 and 7.4 quarts of milk per person per week.

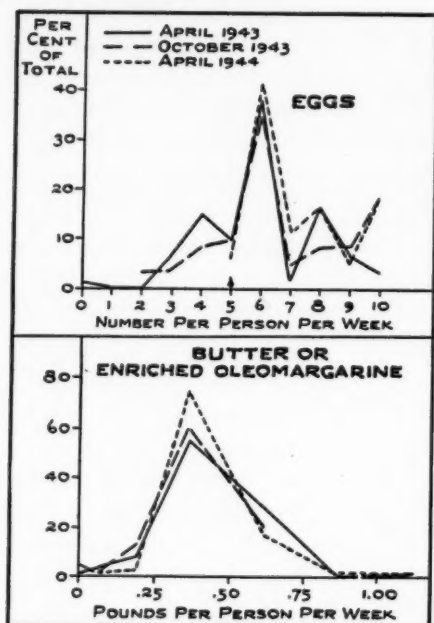


Fig. 2. Percentage distribution of diet records for sixty families in an area of Upper Harlem, New York City, according to the reported use of eggs and butter during one week in April and in October, 1943 and in one week in April, 1944. (The arrow indicates the frequency of use which approximately corresponds to that in the recommended dietary pattern.)

the diet as frequently as is recommended. Only 8 per cent of the families used citrus fruits and tomatoes less often than six times per week. Slightly more than one-fourth used these fruits twice a day or more often.

When the food records of the families for October were compared with the records for April, 1943, it was found that there was a

Meat. Lean meat, poultry, fish, or dried peas or beans were eaten at least once a day by most of the families at the time of the first visit. Only 3 per cent of the families had meat less than six times a week. Slightly more than three-fourths of the families had meat eight or more times a week. A year later, 88 per cent used meat eight or more times per week. It is interesting to note the increase in the use of meat and meat substitutes during a time of rationing.

Citrus Fruits and Tomatoes. In April, 1943 a high proportion of the families included citrus fruits and tomatoes in

decrease of 36 per cent in the use of citrus fruits and an increase of 102 per cent in the use of tomatoes. Tomatoes, fresh and canned, were plentiful while citrus fruits, especially oranges, were scarce and expensive. This change is of interest because one aim of the public health nurse was to inform families about different foods of similar food value so that the quality of the family diet would not deteriorate due to the scarcity of certain essential foods.

In April, 1944 only two families had citrus fruits and tomatoes less often than six times a week. Fifty-three per cent of the families used citrus fruits and tomatoes fourteen or more times per week.

All Fruits. At the time of the first visit, April, 1943, all fruits, including citrus fruits and tomatoes, were consumed less than an average of twice a day in 18 per cent of the families. Slightly more than one-half of the families, or 53 per cent, had fruit two or three times a day and 28 per cent had fruit more than three times a day. In April, 1944 there was a considerable increase in the use of all fruits. Only 5 per cent of the families had fruit less than thirteen times a week.

Green or Yellow Vegetables. Twenty-three per cent of the families had green or yellow vegetables less than once a day in April, 1943. Six months later only one family used green or yellow vegetables less than once a day, and one year later no family was below standard in the use of green or yellow vegetables.

All Vegetables. In April, 1943 most of the families used less than three vegetables, including white potatoes, per day as recommended. Almost half of the families had vegetables less than twice a day. Vegetables were eaten nineteen or more times per week in only 20 per cent of the families. One year later, 85 per cent of the families reported a frequency in the use of vegetables of nineteen or more times per week. No family reported using vegetables less than fourteen times per week.³⁰

³⁰ Green or yellow vegetables were included in all vegetables. Their substandard use by

(Continued on page 238)

Eggs. At the beginning of the special study about one-fourth of the families used less than the recommended number, five eggs, per person per week. Twenty-eight per cent of the families averaged one egg a day or more per person. A year later all families used the recommended number of eggs.

Butter. Eighty-seven per cent of the families reported using at least one-quarter of a pound of butter or enriched oleomargarine per person per week in April, 1943. After teaching, the distribution of the families with respect to the use of butter did not change noticeably.

Whole Grain Cereal Foods. Although white bread and prepared cereals have been fortified with several vitamins and iron, some dark breads²³ and whole grain cereals have additional nutritive values and their use was recommended. Before the intensive teaching, 47 per cent of the families used dark bread at least once a day. Most of the families had some whole grain cooked cereal during the week. Seventeen per cent had it every day. At the end of the teaching study, 75 per cent of the families used dark bread once a day or more often, and 37 per cent had whole grain cereal every day. This signifies a considerable change in habits with regard to the use of dark bread and cereals.

On the charts in Figures 1 and 2 an arrow indicates the frequency of use of each food group which corresponds approximately to the recommended frequency of use. On the whole, the diets were usually better than the standard recommended. With the exception of the curve for the use of all vegetables in April, 1943, the areas

23 per cent of the families in April, 1943 had some effect on the amount of all vegetables used by the same families. The potato shortage in New York City during the spring months of 1943 also accounted for some of the inadequate use of all vegetables. A comparison of the food records of the families indicated that the frequency in use of white potatoes increased 47 per cent in October, 1943 and 51 per cent in April, 1944 as compared with their use in April, 1943.

²³ No account could be taken of the quality of the dark bread used by these families. Such breads are made largely of mixtures of whole wheat, or rye, and white flours in various proportions. Hence, many so-called dark breads do not measure up to the nutritional standard of enriched white bread.

under the curves and to the right of the arrow show that a large percentage of the families were using the various food groups as much as or more than the frequency recommended. In general, there was an increase in the use of the specific food groups in each period following the beginning of nutrition teaching.

CHANGES IN FOOD HABITS OF INDIVIDUAL FAMILIES

A comparison of the use of various types of foods by the same families at two different periods, before and after special teaching of nutrition, may give some indication of the extent to which the family food patterns have been changed.

The change in the use of the specific food groups can best be described by a comparison of the mean differences in use of specific foods before and after special nutrition instruction was given. These data are shown in Table 5. For each comparison a distribution of "paired differences" was obtained by taking the difference between the values for use of a specific food in the two periods for

Table 5. Mean values for use of different groups of food in one week in April, 1943 and in April, 1944, difference between means for the two periods and standard deviations for distributions of difference in use in the two periods by specific families, Upper Harlem Area of New York City.

SPECIFIC FOOD AND MEASURE OF USE	MEAN FOR ONE WEEK		MEAN DIFFER- ENCE II-I	FOR PAIRED DIFFERENCES	
	April, 1943 I	April, 1944 II		Standard Error of Mean Difference	Standard Devia- tion
Milk, Quarts Per Person	4.98	5.85	.87	±.20	±1.57
Butter, Pounds Per Person	.43	.43	.00	±.03	±.20
Eggs, Number Per Person	6.05	7.63	1.58	±.38	±2.91
Citrus Fruits and Tomatoes, Times Per Week	11.26	13.18	1.93	±.63	±4.91
All Fruits, Times Per Week	17.40	18.60	1.20	±.83	±6.44
Green or Yellow Vegetables, Times Per Week	8.67	12.95	4.28	±.41	±3.21
All Vegetables, Times Per Week	14.90	21.74	6.84	±.66	±5.14
Meat, Times Per Week	9.43	10.07	.63	±.44	±3.40

each family. The standard deviations of the distributions of these differences are shown in Table 5 and indicate the extent of the variation in frequency of use of the various foods by individual families. The significance of the difference between average values for the two periods is indicated by the standard errors of the means for the distribution of paired differences.

All foods except butter showed increases in their mean use. Except for the use of meat and "all fruits," the increases were statistically significant. The most marked increases were in the use of green or yellow vegetables and "all vegetables"; the mean differences were four and seven times per week, respectively. It is apparent that after a period of nutrition education the families showed considerable improvement in the frequency of use of specific foods.

QUALITATIVE CLASSIFICATION OF FOOD HABITS

In order to summarize the dietary patterns of the families, the habits of use of selected foods were classified in a few categories based on the amount of deviation from a dietary pattern prepared by the Committee on Food and Nutrition of the National Research Council. For five food groups, namely, milk, eggs, citrus fruits and tomatoes, green or yellow vegetables, and meat, the habits of use were classified in one of four categories. The categories and the dietary pattern recommended are given in detail in Appendix 2. The category "standard or above" indicates a use equal to or above the recommended standard. "Slightly below standard" indicates a use slightly below the recommended standard. "Marginal" describes a use moderately below standard, and "unsatisfactory" a use considerably below standard.

By combining the ratings for each of the five types of foods, it is possible to get a composite rating which indicates the quality of each family food pattern. A diet was rated "standard or above" if the use of all five food groups met the recommended allowances. A diet was considered as "slightly below standard" if the use of any

food group was a little less than the recommended allowances but all other groups were a little less than, equal to, or more than, the standard recommended. A diet was "marginal" if the one or more food groups with the lowest rating were moderately below the recommended allowances. A diet was classified as "unsatisfactory" if the use of any of the five food groups was more than moderately below standard.

Ratings which are "slightly below standard" may indicate fairly satisfactory family food patterns. However, one aim of the nutrition teaching was to help improve the family food habits so that the dietary pattern would meet or be above the recommended pattern. Consequently, a family with a diet rated as "slightly below standard" was supposed to receive intensive teaching by the public health nurse, as did those classed as "marginal" or "unsatisfactory."

The composite ratings on family food habits for April, 1943 are compared with the ratings one year later. These data are presented in Table 6. In the seven-day period before the first visit, 42 per cent of the family diets were considered as "standard or above"; 47 per cent were rated "slightly below standard"; 8 per cent were "marginal"; and 3 per cent were "unsatisfactory." Ratings which are moderately or considerably below the recommended allowances

Table 6. Distribution of families according to the composite rating on food habits, Upper Harlem Area of New York City.

CLASSIFICATION OF FOOD HABITS	PER CENT			NUMBER OF FAMILIES		
	April, 1943	October, 1943	April, 1944	April, 1943	October, 1943	April, 1944
TOTAL	100.0	100.0	100.0	60	60	60
Standard or Above	41.7	63.4	86.7	25	38	52
Slightly Below Standard	46.7	25.0	11.6	28	15	7
Marginal	8.3	8.3	0	5	5	0
Unsatisfactory	3.3	3.3	1.7	2	2	1

CLASSIFICATION OF FOOD HABITS	PER CENT OF FAMILIES		DIFFERENCES AND THEIR STANDARD ERRORS	NUMBER OF FAMILIES	
	April, 1943	April, 1944		April, 1943	April, 1944
Standard or Above	41.7	86.7	45.0±8.8	25	52
Slightly Below Standard	46.7	11.6	-35.1±8.3	28	7
Marginal	8.3	0	-8.3±3.7	5	0
Unsatisfactory	3.3	1.7	-1.6±1.9	2	1

Table 7. Differences in composite ratings on food habits of sixty families, Upper Harlem Area of New York City, April, 1943 and April, 1944.

indicate definitely inadequate dietary patterns, and when the special teaching project was inaugurated, 12 per cent of the families had diets in this class. One year later, that is in April, 1944, the distribution of families is strikingly different. Eighty-seven per cent had a dietary pattern equal to or above the recommended standard and only 2 per cent were marginal or considerably below standard.

Obviously, these changes in ratings of food habits are significant and they may be tested statistically.²² The differences between the first visit and the visit one year later in the ratings are presented in Table 7. The difference of 45.0 in the ratings of "standard or above" was five times its standard error 8.8. For ratings of "slightly below standard," the difference was -35, or four times its standard error. It is evident that in every classification presented, except "unsatisfactory," the difference was significant. It may be concluded that the improvement in the food habits of the families given intensive nutrition instruction was not due to chance variation. This indicates some measure of success in teaching.

CONTENT OF THE NURSES' TEACHING

The data presented thus far have shown that there was improve-

²² The differences were tested by the use of the formula,

$$\sigma \text{ diff.} = \sqrt{pq \left(\frac{1}{n_1} + \frac{1}{n_2} \right)}$$

ment in the food habits of most of the families after the periods of nutrition teaching. It is of interest at this point to describe in some detail the general content of the special teaching given by the public health nurse and to indicate where emphasis in teaching was placed.

In their teaching the nurses emphasized the need for frequent use of specific foods in order to obtain a diet of good quality. Nutritive values of specific foods, including their vitamin and mineral content, were explained to the housewife. Instruction was given about the wisest selection of foods within each food group, both for nutritive values and for the best use of the food budget. There was teaching about the best neighborhood places to shop for food and about the wisest distribution and expenditure of the family supply of ration points. The care of food and methods of preparing food so as to prevent waste of nutritive values were discussed. To obtain more varied menus, different ways of preparing specific foods were suggested.

To obtain the best possible use of ration points the families were instructed to mix oleomargarine and butter, and to substitute cheese or dried peas and beans for meat occasionally. They were encouraged to include the highly nutritious organ meats in the diet and were given detailed information about the preparation of these meats. Suggestions were made to serve more milk by using it in puddings, custards, and cream dishes, and to serve fruit instead of rich pastry for desserts. Families were also advised to keep a stock of canned vegetables on hand for use when the prices of fresh vegetables were high.

When the food habits of the family were found to be equal to or better than the recommended standard, the nurse either did no teaching or reviewed the requirements of an adequate diet. These housewives were complimented because of their achievement and encouraged to continue to provide a good diet for the family.

After the general content of the nutrition teaching has been described, the question which quite naturally follows is: Was

SPECIFIED FOOD GROUP	TOTAL	USE OF SPECIFIED FOOD STANDARD OR ABOVE AT BEGINNING OF PERIOD		USE OF SPECIFIED FOOD BELOW STANDARD AT BEGINNING OF PERIOD	
		A Specific Teaching During Three- Month Period	B No Teaching	C Specific Teaching During Three- Month Period	D No Teaching
		PER CENT OF TOTAL FAMILIES			
		FIRST TEACHING PERIOD			
Milk	100.0	26.7	61.6	11.7	0
Butter	100.0	11.7	75.0	11.7	1.6
Eggs	100.0	13.3	63.4	18.3	5.0
Fruits	100.0	28.3	53.4	18.3	0
Vegetables	100.0	11.7	6.7	56.6	25.0
Meat	100.0	28.3	48.3	16.7	6.7
Cereals and Bread	100.0	21.6	25.0	26.7	26.7
		SECOND TEACHING PERIOD			
Milk	100.0	40.0	53.3	6.7	0
Butter	100.0	11.7	68.3	18.3	1.7
Eggs	100.0	18.3	66.7	13.3	1.7
Fruits	100.0	38.3	48.4	13.3	0
Vegetables	100.0	55.0	20.0	25.0	0
Meat	100.0	8.3	76.7	5.0	10.0
Cereals and Bread	100.0	13.3	63.4	5.0	18.3
		NUMBER OF FAMILIES			
		FIRST TEACHING PERIOD			
Milk	60	16	37	7	0
Butter	60	7	45	7	1
Eggs	60	8	38	11	3
Fruits	60	17	32	11	0
Vegetables	60	7	4	34	25
Meat	60	17	29	10	4
Cereals and Bread	60	13	15	16	16
		SECOND TEACHING PERIOD			
Milk	60	24	32	4	0
Butter	60	7	41	11	1
Eggs	60	11	40	8	1
Fruits	60	23	29	8	0
Vegetables	60	33	12	15	0
Meat	60	5	46	3	6
Cereals and Bread	60	8	38	3	11

Table 8. Distribution of families in each teaching period according to rating and instruction given for each food group, Upper Harlem Area of New York City.

specific teaching done in families where the need for such teaching was greatest? Table 8 shows for each food group (1) the families in which the use of the specified foods was standard or above, and (2) those in which the use was below standard at the beginning of each study period. In each of these two groups the families are classified according to whether there was teaching or no teaching concerning the specific foods. For example, in the first teaching period, no families below standard in the use of milk failed to receive teaching concerning the need for milk in the diet.

Column D in Table 8 indicates where there was a lack of teaching, though a need was indicated because the use of the food group was below standard. During the first teaching period 25 per cent of the families received no instructions about the need for increased use of vegetables, and 26 per cent received no teaching about the advisability of including dark bread or whole grain cereals in the diet. On the other hand, there were families given instructions about the use of each food group where need for such instruction was not indicated (Column A).

During the second teaching period fewer families failed to receive instruction about the use of specific foods where there was need for such instruction. The greatest change in this respect was in teaching about the importance of vegetables in the diet. No family needing such instruction failed to receive it. There were eleven families, or 18 per cent of the total number, where no teaching concerning the value of whole grain cereals and dark bread in the diet was done. These families were below standard with respect to this food group. Perhaps less emphasis was placed upon teaching the importance of dark bread and cereals in the diet because of the knowledge that the nutritive value of white bread has been improved through enrichment.

In the special teaching program the families received what may be termed "general nutrition instruction" as well as teaching about specific food groups. Table 9 shows the content of the "general

nutrition teaching" and the number of families receiving such teaching during the period April-June, 1943. Thirty-five per cent of the families had no "general teaching." Forty-seven per cent of the families were taught concerning the best use of the money available for food; in 13 per cent advice was given about the best use of ration points; and in 8 per cent the housewife was encouraged to estimate the family food needs before shopping for food. The importance of well-balanced meals, including instruction as to what constitutes a good breakfast and a good luncheon, was explained to 10 per cent of the families. Four families were given general information about the care and preparation of food to preserve nutritive values. It is apparent that "general nutrition teaching" consisted chiefly of advice concerning the economic problems of the family.

Tables 8 and 9 have shown that with certain exceptions the nutrition teaching in the sixty families was done on a selective basis. On the whole, families needing advice about the use of specific foods were given such advice.

The results of the teaching experiment described in this report

Table 9. Content of "General Nutrition Teaching" in sixty families, Upper Harlem Area of New York City, April to June, 1943.

CONTENT OF GENERAL TEACHING	PER CENT OF TOTAL	NUMBER OF FAMILIES
No General Teaching	35.0	21
Teaching Concerning: ¹		
Well-Balanced Meals	10.0	6
Wise Expenditures for Food	46.7	28
Family Food Budget	8.3	5
Best Use of Ration Points	13.3	8
Estimating Food Needs Before Marketing	8.3	5
Care and Preparation of Food to Preserve Nutritive Values	6.7	4

¹ Families with teaching in more than one classification of general teaching are included in each classification in which they had teaching.

indicate a high degree of success because there was a significant improvement in the food habits of the families. This was true even though the level of the food habits in some families was relatively high at the beginning of the experiment. It is apparent that more was accomplished through a program of special nutrition teaching than resulted from nutrition teaching which was a part of the usual nursing program in these families. Also, the maximum improvement was noted after six months of special instruction. To bring about these results, the nurses usually made one visit to the family in each of the six months; more than one visit per month was made in only five of the sixty families.

Families with a serious health problem, such as tuberculosis, probably are most receptive to teaching about the importance of nutrition for the maintenance of good health. Because of exposure to infection, their family members form a group especially liable to future illness and disability. It is hoped, therefore, that in public health nursing programs, considerable emphasis will be placed upon teaching better food habits in all such families when the dietary pattern indicates need for teaching. The experiment reported here has shown this to be a feasible program.

SUMMARY

An experiment in nutrition teaching by public health nurses was carried on in sixty tuberculous families in an area of Upper Harlem in 1943. The reported use of each of five foods or food groups was compared with amounts recommended in the dietary pattern prepared by the Food and Nutrition Board of the National Research Council. The data are presented for two periods: (1) after three months of special teaching, and (2) after two three-month periods of teaching.

Comparison of the use of various types of foods by the same families at two different periods (before and after teaching) indicated a significant increase in the use of specific foods after teaching.

The greatest increases were noted in the use of green or yellow vegetables and of "all vegetables."

From study of the content of the nurses' nutrition teaching it was concluded that on the whole the teaching in the sixty families was done on a selective basis. Most families needing advice about the use of specific foods were given such advice.

It is hoped that in public health nursing programs considerable emphasis will be placed upon improvement of food habits in families with a serious health problem, such as tuberculosis, when the dietary pattern indicates need for teaching. The experiment reported upon here has shown this to be a feasible program.

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Distr
week, U

TOTAL

1.5-2
2.5-3
3.5-4
4.5-5
5.5-6
6.5-7
7.5-8
8.5

TOTAL

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4 0
6 0
8 0
10 0
12 0
14 0
16 0
18 0

TOTAL

1
4
6
8
10
12
14
16
18

APPENDIX I

Distribution of families according to frequency of use of specified foods per week, Upper Harlem Area of New York City.

	PER CENT			NUMBER OF FAMILIES		
	April, 1943	October, 1943	April, 1944	April, 1943	October, 1943	April, 1944
MILK (QUARTS PER PERSON PER WEEK)						
TOTAL	100.0	100.0	100.0	60	60	60
1.5-2.4	5.0	1.7	0	3	1	0
2.5-3.4	6.7	5.0	1.7	4	3	1
3.5-4.4	33.3	21.6	11.7	20	13	7
4.5-5.4	20.0	30.0	28.3	12	18	17
5.5-6.4	15.0	15.0	23.3	9	9	14
6.5-7.4	15.0	15.0	28.3	9	9	17
7.5-8.4	5.0	6.7	6.7	3	4	4
8.5 or More	0	5.0	0	0	3	0
LEAN MEATS (TIMES PER WEEK)						
TOTAL	100.0	100.0	100.0	60	60	60
0	0	0	0	0	0	0
1	0	0	0	0	0	0
2 or 3	0	0	0	0	0	0
4 or 5	3.3	0	0	2	0	0
6 or 7	20.0	15.0	11.7	12	9	7
8 or 9	28.3	33.3	31.7	17	20	19
10 or 11	31.7	25.0	33.3	19	15	20
12 or 13	10.0	21.6	16.7	6	13	10
14 or 15	5.0	1.7	3.3	3	1	2
16 or 17	1.7	1.7	3.3	1	1	2
18 or More	0	1.7	0	0	1	0
CITRUS FRUITS AND TOMATOES (TIMES PER WEEK)						
TOTAL	100.0	100.0	100.0	60	60	60
0	0	1.7	0	0	1	0
1 or 2	1.7	1.7	1.7	1	1	1
3	1.7	3.3	0	1	2	0
4 or 5	5.0	1.7	1.7	3	1	1
6 or 7	10.0	6.7	1.7	6	4	1
8 or 9	16.6	11.6	6.7	10	7	4
10 or 11	16.6	16.6	18.3	10	10	11
12 or 13	21.7	6.7	16.6	13	4	10
14 or 15	8.3	31.7	25.0	5	19	15
16 or 17	11.7	11.6	25.0	7	7	15
18 or More	6.7	6.7	3.3	4	4	2

	PER CENT			NUMBER OF FAMILIES		
	April, 1943	October, 1943	April, 1944	April, 1943	October, 1943	April, 1944

	ALL FRUITS (TIMES PER WEEK)					
TOTAL	100.0	100.0	100.0	60	60	60
0	0	0	0	0	0	0
1 to 3	1.7	0	0	1	0	0
4 to 6	3.3	0	1.7	2	0	1
7 to 9	1.7	1.7	1.7	1	1	1
10 to 12	11.7	6.7	1.7	7	4	1
13 to 15	8.3	11.6	21.6	5	7	13
16 to 18	30.0	18.3	20.0	18	11	12
19 to 21	15.0	21.7	16.6	9	13	10
22 or More	28.3	40.0	36.7	17	24	22

	GREEN OR YELLOW VEGETABLES (TIMES PER WEEK)					
TOTAL	100.0	100.0	100.0	60	60	60
0	0	0	0	0	0	0
1 or 2	0	0	0	0	0	0
3 or 4	1.7	0	0	1	0	0
5 or 6	21.7	1.7	0	13	1	0
7 or 8	28.3	3.3	3.3	17	2	2
9 or 10	25.0	20.0	18.3	15	12	11
11 or 12	15.0	48.4	20.0	9	29	12
13 or 14	5.0	18.3	31.7	3	11	19
15 or 16	3.3	3.3	16.7	2	2	10
17 or 18	0	3.3	8.3	0	2	5
19 or More	0	1.7	1.7	0	1	1

	ALL VEGETABLES (TIMES PER WEEK)					
TOTAL	100.0	100.0	100.0	60	60	60
0-3	0	0	0	0	0	0
4-5	0	0	0	0	0	0
6-7	3.3	0	0	2	0	0
8-9	5.0	0	0	3	0	0
10-11	13.4	0	0	8	0	0
12-13	23.3	0	0	14	0	0
14-15	15.0	6.7	3.3	9	4	2
16-18	20.0	16.7	11.7	12	10	7
19-21	11.7	38.3	26.7	7	23	16
22-24	5.0	23.3	43.3	3	14	26
25 or More	3.3	15.0	15.0	2	9	9

	PER CENT			NUMBER OF FAMILIES		
	April, 1943	October, 1943	April, 1944	April, 1943	October, 1943	April, 1944

BOGS (NUMBER PER PERSON PER WEEK)

TOTAL	100.0	100.0	100.0	60	60	60
0-0.4	1.7	0	0	1	0	0
0.5-1.4	0	0	0	0	0	0
1.5-2.4	0	3.3	0	0	2	0
2.5-3.4	6.7	3.3	0	4	2	0
3.5-4.4	15.0	8.3	0	9	5	0
4.5-5.4	10.0	10.0	6.7	6	6	4
5.5-6.4	38.3	35.1	41.7	23	21	25
6.5-7.4	1.7	5.0	11.7	1	3	7
7.5-8.4	16.6	8.3	16.6	10	5	10
8.5-9.4	6.7	8.3	5.0	4	5	3
9.5 or More	3.3	18.4	18.3	2	11	11

BUTTER OR ENRICHED OLEOMARGARINE
(POUNDS PER PERSON PER WEEK)

TOTAL	100.0	100.0	100.0	60	60	60
No Butter	1.7	5.0	0	1	3	0
Less Than .125 lbs.	3.3	1.7	1.7	2	1	1
.125-.24 lbs.	8.3	13.3	3.3	5	8	2
.25-.49 lbs.	56.7	60.0	75.0	34	36	45
.50-.74 lbs.	28.3	20.0	16.6	17	12	10
.75-.99 lbs.	0	0	1.7	0	0	1
1.00 or More	1.7	0	1.7	1	0	1

DARK BREAD AND CEREALS (TIMES PER DAY)

TOTAL	100.0	100.0	100.0	60	60	60
<i>Dark Bread</i>						
None	16.7	11.7	18.3	16	7	11
Less Than Once a Day	16.7	8.3	6.7	16	5	4
Once a Day	31.6	28.3	28.3	19	17	17
Twice a Day	11.7	23.4	26.7	7	14	16
Three or More Times a Day	3.3	28.3	20.0	1	17	12
<i>Dark Cooked Cereal</i>						
None	15.0	10.0	6.6	9	6	4
Less Than Once a Day	68.3	63.3	56.7	41	38	34
Once a Day	16.7	26.7	36.7	10	16	22

was considered as a milk substitute. When the milk requirement was met with some of the cheese used, the rest of the cheese was considered as a meat substitute. All of the cheese used was considered as a meat substitute when the milk requirement was met without the use of cheese.

Procedure for using cheese as a milk substitute (based on values for calcium):

1. 1 lb. of cottage cheese = 1 pt. of milk
2. 5 ounces of cheese (other than cottage cheese) = 1 qt. of milk

Procedure for using cheese as a meat substitute (based on protein values):

1. 2 ounces of cheese (other than cottage cheese) = 1 serving of meat
2. 3 or 4 ounces of cottage cheese = 1 serving of meat

Procedure for using dried peas or beans as a meat substitute:

1 serving of dried peas or beans = 1 serving of meat

The dietary pattern to meet recommended allowances outlined by the Food and Nutrition Board of the National Research Council is as follows:

Milk, adults—1 pt. daily; children—1 qt. daily

Vegetables—2 servings daily—1 green or yellow

Fruit—2 servings daily—1 citrus or tomato and 1 other

Eggs—3 or 4 times per week

Meat—1 serving daily

Whole grain or "enriched" cereal and bread—at least half the intake

Butter or fortified oleomargarine (100-500 calories)

Potato—1 or more servings daily

SOCIAL AND PSYCHOLOGICAL FACTORS AFFECTING FERTILITY

III. THE COMPLETENESS AND ACCURACY OF THE HOUSEHOLD SURVEY OF INDIANAPOLIS¹

P. K. WHELPTON AND CLYDE V. KISER

HOW accurate are data collected in the studies carried on by various agencies whose enumerators make a house-to-house survey, have a relatively simple schedule to fill out, and cannot spend much time to establish *rapport* with each informant? Are the errors numerous or few, small or large? Do they tend to be compensating, or do overstatements predominate for certain questions and understatements for others? Are these matters related to the socio-economic status of the respondents, and if so in what way? Questions like these arise frequently in the minds of users of data gathered in such a manner. Usually the limitations of the study make it impractical to test the data in the field, even on a sample basis.² Occasionally, however, the house-to-house survey is carried on primarily to locate cases for a subsequent intensive study, in which case it is a simple matter to determine the accuracy of the

¹ This is the third of a series of reports on a study conducted by the Committee on Social and Psychological Factors Affecting Fertility, sponsored by the Milbank Memorial Fund with grants from the Carnegie Corporation of New York. The Committee consists of Lowell J. Reed, Chairman; Daniel Katz; E. Lowell Kelly; Clyde V. Kiser; Frank Lorimer; Frank W. Notestein; Frederick Osborn; S. A. Switzer; Warren S. Thompson; and P. K. Whelpton.

A summary of part of the material considered in this paper was contained in Whelpton, P. K. and Kiser, Clyde V.: *Social and Psychological Factors Affecting Fertility. I. Differential Fertility Among 41,498 Native-White Couples in Indianapolis*. The Milbank Memorial Fund *Quarterly*, July, 1943, xxi, No. 3, pp. 273-278 (Reprint pp. 53-58). Certain slight differences in the data presented in the two articles are due to the correction of errors discovered during the interim.

² A study by Lienau includes a section relating certain characteristics of enumerators (including scoring ability on psychological tests) to accuracy of data collected in the National Health Survey. No revisits were made for this study, however, and the author's criteria of accuracy were few and based upon questionable assumptions. Nevertheless, the results are suggestive. See Lienau, C. C.: *Selection, Training and Performance of the National Health Survey Field Staff*. *The American Journal of Hygiene*, November, 1941, xxxiv, No. 3, Sec. A., pp. 110-132.

first group of schedules. The results of such a test are presented in this report.

The Household Survey of Indianapolis, conducted during the summer of 1941, was a preliminary step in a Study of Social and Psychological Factors Affecting Fertility.³ In the Survey an attempt was made to fill out a short schedule for virtually every dwelling unit occupied by white persons. If a native-white couple was living in the dwelling unit and the wife was under 45 years of age, the following questions were asked as of the time of the interview:

A. Couple

- (1) Year of marriage
- (2) Tenure of dwelling unit
- (3) Rent paid for dwelling unit or monthly rental value if owned
- (4) Whether lived all the time since marriage in a city of 25,000 or more and if not, how many years

B. Wife and Husband

- (1) Age at last birthday
- (2) State of birth
- (3) Whether married previously
- (4) Highest grade of school completed
- (5) Religious preference (Protestant, Catholic, Jewish, other, or none)

C. Wife

- (1) Number of live births
- (2) Number of children living

In addition, the canvasser listed the informant (wife, husband, child, neighbor, etc.).

Completeness of coverage, and the accuracy of the data gathered in such a survey, probably are influenced considerably by the sponsorship, by the type of canvasser, and by the conditions under which the canvassers work. The Household Survey was sponsored by the Indianapolis Council of Social Agencies, a fact that was mentioned

³The Household Survey of Indianapolis usually will be referred to hereafter as the Survey, and the Study of Social and Psychological Factors Affecting Fertility, as the Study.

in publicity material and by the canvassers in introducing themselves, and that is believed to have helped substantially in securing cooperation.⁴ Most of the canvassers were recent college graduates with a real interest in scientific study; all were highly recommended by competent persons. They were given careful training and supervision by Miss Emily Marks, who was in immediate charge of the Survey. They were paid by the hour (65c) so that they would not feel under pressure to hurry unduly, omit questions, and skip less accessible dwellings. Finally, they were told that certain of the households would be revisited later by the more experienced interviewers of the Study, and that their schedules for these households would be verified. For these reasons, particularly the latter, this Survey may compare favorably with others of a similar nature with respect to completeness of coverage and the accuracy of the information obtained.

COMPLETENESS OF COVERAGE

Completeness of coverage can best be tested by comparing the number of dwelling units according to the Survey with the corresponding figure from the 1940 Federal Census of Housing. The definition of "dwelling unit" used in the Survey was based on that used in the Census, the primary criterion for determining whether living quarters constituted a dwelling unit being the presence of cooking facilities.⁵

As of April 1, 1940, the Census reported 97,749 dwelling units occupied by white persons, and 4,367 vacant dwelling units. The Survey was conducted from March 1 to August 31, 1941, most of the work being done between June 10 and August 20. Schedules

⁴ The Committee conducting the Study wishes to express again its appreciation for this cooperation, and also its thanks to the Council and the Extension Center of Indiana University for providing office space.

⁵ For the Census definition, see Sixteenth Decennial Census of the United States. "Instructions to Enumerators." Housing, 1940, p. 2, and "Instructions to Enumerators." Population and Agriculture, 1940, p. 37.

For the Survey definition, see Whelpton and Kiser, *op. cit.*, p. 273 (Reprint p. 53).

were filled out for 102,838 dwelling units occupied by white persons, and 2,601 vacant units available for white persons. Before these figures are compared with those of the Census, however, adjustments should be made for three reasons. First, since the primary purpose of the Survey was to locate white couples meeting the requirements set up for the subsequent detailed Study, the complete coverage of areas with nonwhite inhabitants was not attempted. Blocks listed by the 1939 Real Property Inventory as having colored persons living in 91 per cent or more of the occupied dwelling units were not assigned to canvassers, for it was believed that few white couples would be found in them. Second, after part of the business district was canvassed, it was decided in the interest of economy that the canvassers should not cover the remaining blocks in the district that were listed in the 1939 Real Property Inventory as having no dwelling units. Third, the canvassers were refused information regarding the number of dwelling units in five apartment hotels and (unlike the Census enumerators) could not compel cooperation. Obviously, the 501 blocks belonging in these three categories should be excluded from the comparison.

In the 4,219 blocks presumably covered by both the Census and the Survey, the Census counted 96,842 dwelling units occupied by white persons and 4,102 vacant dwelling units, and the Survey 102,432 and 2,589, respectively. The Survey total for the two groups is 105,021, which is 4,077 or 4.0 per cent above the Census total of 100,944. Most of this excess appears to be due to the population growth that occurred during the fourteen to seventeen months between the two undertakings, for on May 1, 1942, twenty-five months after the Census and approximately ten months after the Survey, the estimated population of Marion County, Indiana (in which Indianapolis is located), based on the registration for War Ration Book One, was 7.1 per cent larger than the Census count.*

* In comparing rates of increase for population and dwelling units, it should be remembered that the Census was taken in 1939 and the Survey in 1942.
(Continued on page 258)

In order to test more precisely the completeness of coverage of the Survey a field check was made of 191 blocks containing no colored residents and having the more important differences between the Census and Survey counts of dwelling units.⁷ As would be expected, the check shows that in some of the blocks both the Census and the Survey figures are correct for their respective dates, the difference between them being due to the building or demolition of houses during the interim. The former occurred in 17 blocks near the outer edge of the City, in which the Survey counted 373 dwelling units and the Census 132. The latter occurred in one block where 16 dwelling units were torn down to make way for a factory.

Among the remaining 173 blocks the field check shows there are 157 for which the Survey count appears correct, 15 for which it is certainly incorrect, and 1 for which its accuracy cannot be determined.⁸ The Survey errors in 3 of the 15 blocks were made by assigning some of the dwelling units to the wrong block, and probably were caused in part, at least, by incorrect street names on the map.⁹ In another block a similar mistake occurred and in addition 3

bered that a reduction of vacancies permits population to increase more rapidly than dwelling units, and that under conditions like those in question there would be a tendency for families to "undouble" because of the improvement in economic conditions. The latter would be offset, however, by an unusually high proportion among migrants of husbands without their families (because of a belief before Pearl Harbor that the boom due to the European war would be temporary), and later would be reversed by a scarcity of vacant dwelling units.

⁷ The 191 blocks include the following: (a) all (62) blocks for which the Census count of dwelling units exceeds that of the Survey by 10 or more; (b) 118 of the 146 blocks in which the Survey count exceeds that of the Census by 10 or more dwelling units; and (c) 11 blocks in which the difference is smaller, but believed related to the differences in the foregoing blocks. The remaining 28 blocks referred to in "(b)" were included in the original plan but were omitted on the last day of the field work because of the findings in the other blocks.

Blocks with nonwhite inhabitants were omitted from the field check because the Survey canvassers were not instructed to fill out a schedule for every dwelling unit occupied by colored persons, nor for every vacant unit apparently available for colored rather than for white persons.

⁸ For this block, occupied entirely by the State Fair Grounds (now used by the Army), the Census shows 17 and the Survey 4 dwelling units.

⁹ The maps used by both the Census enumerators and the Survey canvassers were prepared by the Bureau of the Census from maps of the Indianapolis Engineer. The Committee

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dwelling units were omitted. In the remaining 11 blocks a total of 306 dwelling units were missed. Two of these 11 blocks (with 168 dwelling units) were omitted entirely. In 9 blocks the scattered omissions amount to 138 dwelling units. If allowance is made for similar omissions in blocks not included in the field check (either because the block contained nonwhite inhabitants, or the Survey count differed from that of the Census by fewer than 10 dwelling units), it seems probable that a total of 500 to 600 of the dwelling units which should have been counted in the Survey were omitted. In other words, the completeness of the dwelling unit coverage of the Survey is approximately 99.5 per cent.¹⁰

ACCURACY OF INFORMATION

The accuracy of the Survey data can be measured by comparing them with data on the same items from the Study. The latter was begun a few weeks after the Survey,¹¹ and was limited to couples with the following characteristics: husband and wife native white; both Protestant; married in 1927, 1928, or 1929; wife under 30 and husband under 40 at marriage; neither married previously; both elementary school graduates; and residents of a city of 25,000 or more for at least eight years since marriage.¹² According to the Survey schedules, 2,589 couples met these requirements and were eligible for the Study. Of these, 1,648 were visited by women with graduate training in psychology, sociology, or social case work, and with successful experience as interviewers. From 860 couples a large amount of detailed information was obtained in a series of inter-

in charge of the Study is very grateful to the Bureau for making copies of these maps available for the Survey, since without them the taking of the Survey would have been much more difficult.

¹⁰ The Survey also afforded some basis for appraising the completeness of the 1940 Census enumeration of dwelling units in Indianapolis. This subject will be discussed in an article planned for another publication.

¹¹ The median interval between Survey and Study visit was 2.6 months; the total range extended from less than one month to seven months.

¹² The bearing of errors in reporting these matters on actual eligibility for the Study is discussed in the Appendix.

views—three with the wife and one with the husband. Excellent *rapport* was established as a rule, and answers were obtained to a large number of highly personal questions. In the opinion of the field workers, nearly all of these husbands and wives tried to answer the questions as accurately as possible. From an additional 685 couples a smaller amount of information was obtained, most of it from the wife under conditions favorable to cooperation.³³ A comparison of the entries on these 1,545 schedules with those on the Survey schedules should permit a fairly reliable evaluation of the correctness of the latter.³⁴

In order to use with maximum efficiency the funds available for

Table 1. The distribution by number of live births of eligible couples, and couples included in the test.¹

COUPLES	TOTAL	NUMBER OF LIVE BIRTHS				
		None	One	Two	Three	Four or More
Eligible Couples	2,589 ²	529	727	801	310	221
Couples in Test	1,545	371	340	354	275	205
<i>Percentage Distribution:</i>						
Eligible Couples	100.0	20.4	28.1	31.0	12.0	8.5
Couples in Test	100.0	24.0	22.0	22.9	17.8	13.3

¹ Based on data from the Survey schedules.

² Includes one couple for whom number of live births was not stated. "Eligible" couples are those meeting the requirements for the Study (explained in the text) on the basis of entries on the Survey schedules.

³³ Of the 103 couples from whom no information usable in this paper was obtained, 70 couples (4.2 per cent of the 1,648 couples visited) refused to cooperate in any way.

³⁴ It is recognized, of course, that (a) discrepancies between the two sets of data may arise from errors in the second rather than the first, or from conflicting errors in each, and (b) lack of discrepancy does not guarantee accuracy. But confidence in the accuracy of the data from the Study seems justified in view of the great amount of cross checking that was done, which enabled the interviewers to inquire carefully into apparent discrepancies due to faulty memory (which were frequent) or to attempts to mislead (which were rare).

It is also recognized that restricting the tests to native-white couples with at least a grammar school education may tend to minimize the frequency and magnitude of the discrepancies of an urban survey. The educational restrictions may not have important bearing, however, in view of the discussion in a subsequent section of the relation between accuracy and variations in education from eighth grade to college graduate.

(Continued on page 261)

field work in the Study it was decided to try to interview nearly 80 per cent of the couples with no live birth, all of those with three or more, but only about half of those with one or two.³⁵ Primarily because of this sampling procedure, but in minor degree because of other factors such as the relation between size of family and the ease of finding the wife at home and securing her cooperation, the distribution by number of live births of the 1,545 couples included in the test differs widely from that of the 2,589 couples eligible for the Study (*see* Table 1). For this reason the relation between the number of live births and the accuracy of the Survey data deserves first consideration.

ACCURACY OF REPORTS BY NUMBER OF LIVE BIRTHS

The relation between number of live births and the accuracy of replies to seven Survey questions may be examined in Table 2.³⁶ These data for wife informants show that with one exception the variations between groups in the frequency of different types of error are small in absolute numbers, and that the variations in the percentage of correct replies are small both absolutely and relatively. The single exception occurs in the reports on rent or rental value, the percentage agreeing within 4.9 per cent being 66.4 for couples with one live birth as compared with 53.3 to 55.4 for those with none, two, or three. But even here, as in the other cases, the relation is not consistent, for the second highest percentage correct (58.8) occurs among couples with four or more live births.³⁷ If the parity

The "number of reports" mentioned in the tables indicates the number of available comparisons on the given item. These numbers are smaller than 1,545 as a result of "unknowns" either in Form 1 (used in the Household Survey) or in Forms A, E, or S (used in the subsequent Study). *See* footnotes 2 and 3 of Table 2.

³⁵ The method of sampling, the reasons for choosing the sampling ratios that were used, and the representativeness of the couples in the sample and of those interviewed, will be discussed by the authors in a forthcoming article.

³⁶ The other questions are not considered in this section because (as will be shown in the following section) they were answered correctly for such a high proportion of couples that variations in accuracy are not important.

³⁷ Only one of the seventy possible differences between parities in the proportion of
(Continued on page 264)

Table 2. Accuracy of reports, by question and number of live births.

QUESTION AND ACCURACY	ALL INFORMANTS							WIFE INFORMANTS						
	Total		Number of Live Births					Total		Number of Live Births				
	Unadjusted for Sampling	Adjusted for Sampling ¹	0	1	2	3	4 or More	Unadjusted for Sampling	Adjusted for Sampling ¹	0	1	2	3	4 or More
<i>Year of Marriage</i>														
Number of Reports ^a	1,527	2,588	367	337	352	270	201	1,194	2,028	260	271	280	209	174
Percentage:														
Correct	84.6	84.7	85.3	80.4	89.2	85.9	80.6	88.4	88.5	91.5	84.5	91.4	89.5	83.3
1 Year in Error	11.1	11.3	8.7	15.4	8.5	10.4	13.9	8.6	8.8	5.8	12.2	6.8	7.7	11.5
2+ Years in Error	4.3	4.0	6.0	4.2	2.3	3.7	5.5	3.0	2.7	2.7	3.3	1.8	2.9	5.2
<i>Years in Large Cities</i>														
Number of Reports ^a	1,489	2,588	352	326	347	266	198	1,164	2,028	249	264	276	204	171
Percentage:														
Correct	88.0	88.5	88.1	90.2	89.0	85.0	86.9	88.6	89.2	88.8	91.3	90.2	84.3	86.5
1-2 Years in Error	6.7	6.7	6.8	6.1	6.6	7.9	6.1	6.6	6.7	6.4	6.4	6.5	7.4	6.4
3+ Years in Error	5.2	4.8	5.1	3.7	4.3	7.1	7.1	4.8	4.1	4.8	2.3	3.3	8.3	7.0
<i>Age of Wife</i>														
Number of Reports ^a	1,501	2,588	361	331	345	267	197	1,177	2,028	257	266	275	208	171
Percentage:														
Correct	74.4	74.3	70.4	74.3	75.7	73.0	81.2	78.8	79.2	74.7	78.2	82.5	76.4	83.0
1 Year in Error	18.7	19.0	19.9	19.3	18.8	19.9	13.7	16.2	16.3	17.5	17.7	14.9	17.8	12.3
2+ Years in Error	6.9	6.7	9.7	6.3	5.5	7.1	5.1	4.9	4.5	7.8	4.1	2.5	5.8	4.7
<i>Age of Husband</i>														
Number of Reports ^a	1,491	2,588	355	330	344	266	196	1,172	2,028	254	265	275	207	171
Percentage:														
Correct	70.4	70.8	66.8	71.8	72.7	69.9	70.9	74.7	75.2	71.7	77.0	76.4	73.9	74.3

1 Year in Error
2+ Years in Error

21.5
8.1

21.3
7.9

23.1
10.1

19.1
9.1

21.5
8.1

18.7
6.1

30.5
7.9

15.8
7.2

19.6
4.0

17.9
8.2

21.6
4.1

1 Year in Error	21.5	21.3	23.1	10.1	10.1	21.5	10.0	25.0	18.9	18.7	20.5	15.8	10.6	17.0	21.6
2+ Years in Error	8.1	7.9	10.1	9.1	5.8	10.2	4.1	6.3	6.1	6.1	7.9	7.2	4.0	8.2	4.1
Highest School Grade, Wife															
Number of Reports ^a	1,498	2,588	358	333	342	267	198		1,177	2,028	256	267	274	208	172
Percentage:															
Correct	76.8	76.8	74.0	76.6	78.1	78.3	77.8	80.6	80.8	80.8	79.7	80.5	82.1	80.8	79.7
1 Grade in Error	13.8	14.0	13.7	15.0	13.5	12.7	14.1	12.5	12.6	11.3	11.3	14.2	12.0	10.6	14.5
2+ Grades in Error	9.4	9.2	12.3	8.4	8.5	9.0	8.1	6.9	6.6	6.6	9.0	5.2	5.8	8.7	5.8
Highest School Grade, Husband															
Number of Reports ^a	1,487	2,588	354	327	343	268	195		1,168	2,028	253	264	273	208	170
Percentage:															
Correct	71.8	72.0	68.4	74.0	71.7	72.0	74.4	74.1	74.0	74.0	71.1	75.0	73.6	75.0	76.5
1 Grade in Error	16.9	16.7	17.8	13.8	17.8	17.5	17.9	16.7	16.8	17.0	17.0	14.4	19.0	15.9	17.1
2+ Grades in Error	11.3	11.3	13.8	12.2	10.5	10.4	7.7	9.2	9.2	11.9	11.9	10.6	7.3	9.1	6.5
Rent or Rental Value															
Number of Reports ^a	1,055	2,588	165	253	277	212	148		837	2,028	126	211	224	165	131
Percentage:															
Agreeing Within 4.9% ⁴	55.7	56.0	55.2	60.9	52.7	52.8	57.4	58.0	58.3	58.3	54.0	66.4	55.4	53.3	58.8
Disagreeing by 5-14.9%	20.9	21.5	24.2	21.7	21.3	18.9	18.2	20.4	20.7	20.7	26.2	19.0	19.6	20.6	18.3
Disagreeing by 15+%	23.3	22.5	20.6	17.4	26.0	28.3	24.3	21.6	21.0	21.0	19.8	14.7	25.0	26.1	22.9

¹ In adjusting for sampling it is assumed for each parity that the accuracy of the Survey schedules is the same for couples for whom schedules were filled out in the Study as for other couples. There were 2,586 couples eligible for the Study but the number of live births was not reported for one of them.

² The number of replies to the first six questions varies because the interviewers did not always ask them in the same order when filling out Form A, and in 41 cases concluded the interview when information was obtained which differed from that on the Survey schedule in sufficient degree to disqualify a couple for the Study.

³ The number of reports of rent or rental value is approximately 70 per cent of the number for each other question because the latter were in Form A of the Study schedules, whereas the rent or value question was on Forms E and S. Form A (but not Form E or S) was filled out for couples who proved to be ineligible, who refused to cooperate completely, and nearly 60 per cent of the childless couples who were classified as sterile.

⁴ Nearly all the reports on rent or rental value either agree exactly or disagree by 5 per cent or more. For all informants only 0.7 percent of the reports are too low by less than 5 per cent, and 0.9 per cent too high by the same margin; for wife informants the corresponding percentages are 0.6 and 1.2, respectively.

groups are ranked as to accuracy of reports, each is found first or second for one or more questions, and also fourth or fifth for another or two. If the results for the seven questions are combined, the largest difference in percentage accurate is only 2.6, couples with two live births ranking highest at 79.3 per cent, and couples with three live births lowest at 76.7 per cent. Finally, adjusting for sampling has a negligible effect on the percentage distribution by accuracy, as is shown by the figures in the two columns under "Total" in Table 2.

As may be seen from a comparison of the right and left-hand panels of Table 2, the replies of all informants are somewhat less accurate than those of wives alone (a topic discussed further in the next section). Also, among all informants in contrast to wives, there is a slight tendency for the degree of accuracy to increase with the number of live births. The reasons are, first, the more accurate reports of wives than of other informants, and second, the direct relation between the number of live births and the likelihood of the wife being at home and seen by the canvasser. But even though variations between groups in the percentage of different errors and of correct replies are larger for all informants than for wife informants, they are small numerically²⁰ and show little relation to number of live births except a tendency toward more errors in the childless group. If the results for the seven questions are combined, the percentage of correct replies is highest (76.2) for couples with 2 and

correct replies of wives is very significant statistically, namely, rent or rental value: 1 and 3 parities. Nine of the differences are moderately significant, namely: (a) age of wife: 0 and 2 or 4+ parities; (b) year of marriage: 0 and 1 or 4+ parities, 2 and 1 or 4+ parities; (c) years lived in large cities: 1 and 3 parities; and (d) rent or rental value: 1 and 0 or 2 parities.

The foregoing and subsequent comparisons are based on the following measures of significance: $\frac{\text{Difference}}{\sigma \text{ difference}}$

> 2.57	very significant
$= 1.96 \text{ to } 2.57$	moderately significant
< 1.96	not significant

²⁰ Only four of the seventy possible differences between parities in the proportion of correct replies of all informants are sufficiently large to have statistical significance, namely: (a) age of wife: 0 and 4+ parities, very significant; 3 and 4+ parities, moderately significant; and (b) year of marriage: 2 and 1 or 4+ parities, very significant.

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4+ live births and lowest (73.9) for those with no live birth. As with wife informants, the difference (2.3) is too small to be important. And as before, adjusting for sampling makes changes of only 0.1 to 0.6 in the percentages of correct replies or specified errors. Hence, adjusting for sampling should not change significantly the analysis of the replies of all respondents.

ACCURACY BY TYPE OF QUESTION AND INFORMANT

The canvassers were instructed to try to obtain the information from the wife, husband, or a relative living with them, and to make several calls if necessary. If they were unable to contact such a person they were instructed to question some one else who was acquainted with the couple. In most of these cases the information was secured from a neighbor, but occasionally from a guest, servant, landlady, or janitor. If the wife (or husband) was seen by the canvasser and refused to state her (or his) age, the canvasser was instructed to record an estimate (labeled as such). In the subsequent interviews connected with the Study, the wife was seen personally in nearly all cases, and the husband in more than half of them.

Number of Wife's Children Living. As would be expected, the accuracy of the Survey data varies widely with the question and with the informant. "Number of wife's children living" was reported with scarcely any errors, only 17 in 1,483 cases.²⁸ (See Table 3.) Six children were omitted who should have been included, and 17 were included who should have been omitted, making a net overcount of 11. If only children under 5 are considered, the net

²⁸ Six of the errors occurred because two wives, one husband, and one housekeeper each reported one adopted child as born to the wife, and two wives each did the same for two such children. (These six couples are half of those with adopted children.) One occurred because a wife omitted a child by a previous marriage, and another because a wife omitted a son attending college. These eight discrepancies are easy to understand, but the other nine are not. Four wives simply reported one too many children, one wife two too many, and one three too many. Only one of the five had lost a child by death. In contrast, one wife with two and another with four children omitted one, while one wife with two omitted both. It is possible that in some of these cases, and perhaps also in others, the canvasser's entry was incorrect rather than the respondent's reply.

Table 3. Accuracy of reports, by question and informant.¹

ACCURACY	INFORMANT					INFORMANT				
	TOTAL	Wife	Husband	Relative	Other	TOTAL	Wife	Husband	Relative	Other
	NUMBER OF WIFE'S CHILDREN LIVING					NUMBER OF LIVE BIRTHS TO WIFE				
Number of Reports	1,483	1,164	147	114	58	1,481	1,164	147	114	56
Percentage:										
Correct	98.9	98.7	99.3	100.0	(98.3)	95.8	96.3	93.2	96.5	(91.1)
1 Too Low	0.3	0.3	—	—	—	2.2	1.9	4.1	1.8	(5.4)
2+ Too Low	0.1	0.1	—	—	—	0.2	0.2	0.7	—	—
1 Too High	0.5	0.5	0.7	—	(1.7)	1.4	1.2	1.4	1.8	(3.6)
2+ Too High	0.3	0.3	—	—	—	0.4	0.4	0.7	—	—
RELIGIOUS PREFERENCE OF WIFE										
Number of Reports	1,498	1,174	148	116	60	1,493	1,170	147	116	60
Percentage:										
Correct	98.9	98.9	99.3	100.0	(95.0)	98.6	98.5	98.6	100.0	(96.7)
Incorrect	1.1	1.1	0.7	—	(5.0)	1.4	1.5	1.4	—	(3.3)
WHETHER WIFE MARRIED PREVIOUSLY										
Number of Reports	1,502	1,174	152	117	59	1,499	1,171	152	117	59
Percentage:										
Correct	98.5	98.7	96.1	99.1	(100.0)	98.3	98.5	97.4	99.1	(94.9)
Incorrect	1.5	1.3	3.9	0.9	—	1.7	1.5	2.6	0.9	(5.1)
STATE OF BIRTH OF WIFE										
Number of Reports	1,499	1,175	149	117	58	1,492	1,172	148	116	56
Percentage:										
Correct	98.5	99.0	98.0	98.3	(91.4)	97.9	98.5	99.3	96.6	(83.9)
Incorrect	1.5	1.0	2.0	1.7	(8.6)	2.1	1.5	0.7	3.4	(16.1)
RELIGIOUS PREFERENCE OF HUSBAND										
Number of Reports	1,498	1,174	148	116	60	1,493	1,170	147	116	60
Percentage:										
Correct	98.9	98.9	99.3	100.0	(95.0)	98.6	98.5	98.6	100.0	(96.7)
Incorrect	1.1	1.1	0.7	—	(5.0)	1.4	1.5	1.4	—	(3.3)
WHETHER HUSBAND MARRIED PREVIOUSLY										
Number of Reports	1,502	1,174	152	117	59	1,499	1,171	152	117	59
Percentage:										
Correct	98.5	98.7	96.1	99.1	(100.0)	98.3	98.5	97.4	99.1	(94.9)
Incorrect	1.5	1.3	3.9	0.9	—	1.7	1.5	2.6	0.9	(5.1)
STATE OF BIRTH OF HUSBAND										
Number of Reports	1,499	1,175	149	117	58	1,492	1,172	148	116	56
Percentage:										
Correct	98.5	99.0	98.0	98.3	(91.4)	97.9	98.5	99.3	96.6	(83.9)
Incorrect	1.5	1.0	2.0	1.7	(8.6)	2.1	1.5	0.7	3.4	(16.1)

Number of Reports Percentage	YEAR OF MARRIAGE					YEARS IN LARGE CITIES				
	I,527	I,194	I,55	I18	60	I,489	I,164	I54	I15	56
	84.6 3.1 0.7 0.7 8.1 2.2 0.8	88.4 2.2 0.5 0.6 6.4 1.3 0.6	79.4 2.6 — 1.9 9.7 5.8 0.6	69.5 6.8 1.7 — 16.1 3.4 2.5	(53.3) (15.0) (3.3) — (30.0) (6.7) (1.7)	88.6 1.7 1.3 0.7 2.4 3.0 2.9	88.6 1.8 1.5 0.6 2.1 2.4 3.0	85.1 1.9 1.3 — 4.5 5.2 1.9	87.0 — 1.7 2.6 6.1 2.6 3.6	(87.5) (1.8) (1.8) (1.8) — (3.6) (3.6)
Number of Reports Percentage	AGE OF WIFE					AGE OF HUSBAND				
	I,501	I,177	I,46	I18	60	I,491	I,172	I,45	I15	59
	74.4 9.5 2.3 2.1 9.2 1.4 1.1	78.8 7.8 1.5 1.5 8.4 1.0 0.8	58.2 16.4 2.7 2.1 13.7 4.8 2.1	70.3 11.0 5.1 2.5 10.2 — 0.8	(33.3) (23.3) (10.0) (13.3) (11.7) (3.3) (5.0)	70.4 9.5 1.5 2.7 12.1 1.7 2.1	74.7 9.0 1.3 1.8 9.9 1.5 1.8	67.6 5.5 — 2.8 18.6 2.8 2.8	54.8 13.9 2.6 5.2 20.0 1.7 1.7	(30.3) (18.6) (8.5) (17.0) (33.7) (5.1) (6.8)
Number of Reports Percentage	HIGHEST SCHOOL GRADE, WIFE					HIGHEST SCHOOL GRADE, HUSBAND				
	I,498	I,177	I53	I14	54	I,487	I,168	I52	I12	55
	76.8 4.7 1.6 1.1 9.1 4.5 2.2	80.6 3.5 1.2 0.8 9.0 3.6 1.3	63.4 7.8 1.3 1.3 11.8 8.5 5.9	62.3 8.8 6.1 3.5 8.8 6.1 4.4	(61.1) (13.0) (1.9) — (5.6) (11.1) (7.4)	71.8 6.4 2.9 1.4 10.5 4.6 2.4	74.1 6.3 2.5 1.1 10.4 3.7 2.0	64.5 5.9 3.9 — 11.8 8.6 5.3	64.3 8.0 3.6 6.3 7.1 3.6	(60.0) (7.3) (7.3) (1.8) (14.5) (7.3) (1.8)

¹ Percentages based on fewer than one hundred reports are shown in parentheses. See also Table 2, footnote 2.

excess is 4. This situation is quite different from that of the Census, for it is probable that between 4.0 and 5.5 per cent of the white children under 5 in Indianapolis were not enumerated in 1940, primarily because the respondents failed to report all children's names.³⁰ A smaller proportion of omissions of children would be expected in the Survey schedules tested than in the Census for several reasons. Probably the more important are: (a) the test is confined to couples in which each spouse was reported as married once only, so that most broken marriages are excluded; (b) the necessity of inquiring specifically about children was emphasized strongly while the canvassers were being trained; and (c) the canvassers had fewer questions to ask, hence fewer instructions to keep in mind.

Number of Live Births to Wife. The related question "number of live births to wife" also was answered in the Survey with relatively few errors, only 62 being found in 1,481 replies. In more than half of these cases (32) it is probable that a child who had died was omitted, and in over a fifth (13) a pregnancy which terminated in nonviable birth apparently was included. In the remaining 17 cases the misstatements parallel those in the number of children living discussed above. Overstatements regarding live births fail to balance understatements, but the net error is small. Strangely enough the proportion of errors in replies of husbands is higher than that in those of relatives (a large majority of whom are relatives of the wife) and nearly as high as that in the replies of "others." The differences are not statistically significant, however.

Religious Preference and Previous Marriage. The questions regarding religious preference of wife and husband (Protestant,

³⁰ According to an estimate made by the Scripps Foundation for Research in Population Problems and used by the Bureau of the Census, nearly 6.4 per cent of the white children under 5 in the United States were not enumerated in 1940. (See U. S. Department of Commerce, Bureau of the Census, Population—Special Reports, "Estimated Population in Continental United States, by Age, Color, and Sex: 1940 to 1942" Series P-44, No. 9.) The same method indicates that approximately 5.2 per cent of those in Indiana were not enumerated. Omissions are believed to be less frequent in large cities than in rural areas.

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Catholic, Jewish, other, or none), and whether she or he had been married previously were answered with a high degree of accuracy, and with little variation by class of informant. Only 17 errors were found in reports of religious preference of wife, and 22 in reports regarding previous marriage. For husbands, the corresponding numbers are small also, 21 and 25. The main reason for so few errors undoubtedly lies in the fact that a high proportion of the wives and husbands in Indianapolis are Protestants, and a still higher proportion have been married once only.²¹ With so large a majority having the characteristics indicated, most of the "other" informants who did not know the answers to these questions could guess them correctly.²²

State of Birth. The information on state of birth collected from wives, husbands, and relatives also is highly accurate, the percentage of correct replies varying from 96.6 to 99.3 (see Table 3). "Others" were less reliable informants, reporting correctly for 91.4 per cent of the wives but only 83.9 per cent of the husbands.²³ They probably were helped in many cases by the fact that between two-thirds and three-fourths of the wives and husbands were born in Indiana. Over half of the errors in state of birth of wife occurred because a wife

²¹ Among the 51,871 native-white couples with wife under 45 in the Indianapolis Survey, 87.9 per cent of the wives and 86.4 per cent of the husbands were reported as married once only. Among the 41,498 native-white couples with wife under 45 and neither spouse married more than once, 83.5 per cent of the wives and 82.3 per cent of the husbands were reported as Protestants. See Whelpton and Kiser, *op. cit.*, pp. 225-226 (Reprint pp. 5-6).

It is possible, of course, that the frequency of errors for these questions would have been different if the test had included couples listed in the Survey as having one spouse (or both) Catholic, Jewish, or married previously, but the relatively small size of these groups precludes large differences.

²² It is interesting to note that the percentage of incorrect reports on "Whether married previously" in this Indianapolis Survey (1.7 and 1.5 for husband's and wife's status, respectively) agrees closely with the percentage of reports which differ as to marital status (1.4) in two successive Philadelphia surveys. (See Palmer, Gladys L.: Factors in the Variability of Response in Enumerative Studies. *Journal of the American Statistical Association*, June, 1943, xxxviii, No. 222, p. 146. The percentage is for the districts with 60 per cent or more native-white residents.)

²³ The following differences in the frequency of errors are statistically significant: (a) state of birth of wife: wives and "others," moderately significant; and (b) state of birth of husbands: wives and "others," and husbands and "others," very significant; relatives and "others," moderately significant.

born in another state was reported born in Indiana. With husbands, however, over 80 per cent of the errors occurred because the informant thought the husband was born outside of Indiana but failed to name the correct state. Perhaps this difference results from the traditional belief that men move around more than women.

Residence Since Marriage. The residence query was phrased "Have you (has the couple) lived in a city of 25,000 or more all the time since marriage?" If the answer was "No" a second question "How many years did you (they) live in smaller places?" was asked. The correct information was given by 88 per cent of the total respondents, most of whom merely said "Yes" to the first question. Because one category includes so many of the couples in the test there is little variation in accuracy by type of informant.²⁴ Over half of the errors are one or two years, but one-fifth of them are five years or more. A large proportion (approximately two-thirds) of all the errors occurred because some respondents had an exaggerated idea of the size of a city, and only a small fraction because of misstatements of the number of years in the cities mentioned. A few errors occurred because residence in the suburbs of a large city (usually Indianapolis) was considered as being in the city proper. Such results would be expected from the wording of the query and the restriction of the test to couples reported in the Survey as having married in 1927, 1928, or 1929 and lived eight or more years in a city of 25,000 or larger.

Year of Marriage. Errors are more frequent in the answers to the remaining questions, especially for "other" respondents. Year of marriage was reported incorrectly by nearly half of this group, though most of the errors are of only one year.²⁵ Husbands made nearly twice as many errors as wives, but only two-thirds as many

²⁴ None of the differences by informant in the percentage of correct reports on residence is statistically significant.

²⁵ The following differences in the percentage of correct replies are very significant: wives and each of the other groups; husbands and "others." That between relatives and "others" is moderately significant.

as relatives. Too recent a year was named in over two-thirds of the incorrect reports, wives making such a mistake about as often as other informants. This bias gives no support to the old saw "Do married people live longer than single people? No, it just seems longer." One might expect that in some cases the reported year of marriage would be earlier than the actual year because of a desire to conceal a premarital conception, but this did not occur for any of the forty-five couples in the Study for whom the computed date of the first conception preceded the reported marriage date. On the contrary, two such marriages were reported in the Survey as having occurred a year later than they actually did, rather than a year earlier.

As stated previously, the only couples interviewed in connection with the Study were those reported in the Survey as married in 1927, 1928, or 1929. With such a recent and narrow range of time, little variation in accuracy with year of marriage would be expected. It is surprising, therefore, to find a significant inverse relationship, with the smallest proportion of errors (12.3 per cent) for couples reported as married in 1927, and the largest proportion (17.6 per cent) for those reported as married in 1929. (See Table 4.) Most of it is due to the difference in the frequency of reports which are one

Table 4. Accuracy of reports of year of marriage, by year (all informants).

ACCURACY	YEAR OF MARRIAGE			
	Total	1927	1928	1929
Number of Reports	1,527	465	500	562
Percentage:				
Correct	84.6	87.7	84.2	82.4
1 Year Too Early	3.1	3.4	3.2	2.7
2-3 Years Too Early	0.7	0.6	0.8	0.5
4+ Years Too Early	0.7	0.4	1.0	0.5
1 Year Too Late	8.1	5.6	8.2	10.0
2-3 Years Too Late	2.2	1.5	1.8	3.0
4+ Years Too Late	0.8	0.6	0.8	0.9

year too late, namely, 5.6 per cent and 10.0 per cent, respectively, for the couples reported as married in 1927 and 1929.²⁰

Age. Age of wife was reported correctly by nearly four-fifths of the wives,²¹ but by a substantially lower proportion of husbands, relatives, and "others." The last were especially unreliable respondents, two-thirds of their replies being incorrect, and approximately one-sixth of them placing the wife's age in the wrong five-year group.²² Oddly enough, husbands made more errors than relatives in reporting wife's age. Reports of husband's age are less accurate than those of wife's age, except when husbands are the respondents. Only about three-fourths of the wives and two-thirds of the husbands stated husband's age correctly, though here, too, most of the errors are of merely one year.²³ The guesses of "others" as to husband's age are poor, only one in five being correct, and over one in four being in the wrong five-year group.

²⁰ The difference between this pair of percentages is very significant statistically, that between the preceding pair is moderately significant.

There was no appreciable tendency to report year of marriage as a round number, as was the case with age (discussed later).

²¹ Table 3 shows 21.2 per cent of the wives as reporting their own age incorrectly. In a small proportion of these cases the wife either stated her age approximately rather than exactly, or refused to state it at all. If the approximate age given was a range, e.g., between 35 and 40, the mid-point was used. If no figure was stated the canvasser's estimate was used, if available.

²² The following differences in the percentage of correct reports on age of wife are statistically significant: wives and husbands, wives and "others," husbands and "others," and relatives and "others," very significant; wives and relatives, and husbands and relatives, moderately significant.

²³ The difference between wives and husbands in the percentage of correct reports on age of husband is not significant, between husbands and relatives is moderately significant, and between other pairs is very significant.

Comparing the reports of age in the 1933 and 1936 Census of the Eastern Health District, Densen found that 78.84 per cent of those for white males and 77.55 per cent of those for white females were within the "true difference group" (i.e., the difference between the age reported on the two dates agreed with the time which elapsed). The simple average of his percentages for the age groups dealt with in the present article (primarily 20-49 for males and 15-44 for females) is 70.2 and 74.0, respectively. These are somewhat below the percentages of correct reports for age of wives and husbands in the Indianapolis Survey. (See Densen, Paul M.: *Family Studies in the Eastern Health District. II. The Accuracy of Statements of Age on Census Records. The American Journal of Hygiene*, July, 1940, xxxii, No. 1, Sec. A. p. 20.)

Densen found that overstatements of age outnumbered understatements somewhat in 1922 and 1933, but that the opposite was true in 1936 (*Ibid.*, p. 35).

Although there may be a general belief that women tend to conceal age more than men, reports of their own age were made more accurately in the Survey by wives than by husbands (*see* Table 3). Moreover, there is little bias in the age reported by wives, almost as many overstating as understating it. Among husbands, however, overstatements of age are nearly three times as numerous as understatements. "Other" respondents flattered wives by reporting them too young more than twice as often as too old, but there is little bias in their reports on husband's age.

Differences between the ages of husband and wife may have a slight influence on the accuracy of reports on age. The percentage of correct reports of husband's age is highest (71.2) when the wife is younger than the husband, and lowest (65.2) when the wife is older than the husband. Correct reports of age of wife are most frequent (75.6 per cent) when the wife is the younger, but least frequent (68.9 per cent) when wife and husband are the same age. But in view of the small number of cases the differences are not statistically significant.⁸⁰

A more important factor affecting the accuracy of reported age is

Table 5. Accuracy of reports of age, by age (all informants).¹

ACCURACY	AGE OF WIFE					AGE OF HUSBAND				
	Total	25-29	30-34	35-39	40-44	Total	28-34	35-39	40-44	45-52
Number of Reports	1,501	159	825	427	90	1,491	548	673	210	60
<i>Percentage:</i>										
Correct	74.4	81.8	76.8	70.0	(58.9)	70.4	70.1	73.7	63.8	(58.3)
1 Year Too Low	9.5	10.1	8.1	10.1	(18.9)	9.5	10.2	7.1	14.3	(11.7)
2 Years Too Low	2.3	0.6	2.2	2.3	(5.6)	1.5	1.8	1.0	2.9	—
3+ Years Too Low	2.1	1.3	2.1	1.6	(6.7)	2.7	3.1	1.0	6.7	(5.0)
1 Year Too High	9.2	5.7	9.2	11.5	(4.4)	12.1	13.1	12.3	8.6	(11.7)
2 Years Too High	1.4	—	1.1	2.3	(2.2)	1.7	0.9	2.4	1.9	(1.7)
3+ Years Too High	1.1	0.6	0.5	2.1	(3.3)	2.1	0.7	2.4	1.9	(11.7)

¹ Percentages based on fewer than one hundred reports are shown in parentheses. *See also* Table 2, footnote 2.

⁸⁰ For 1,180 couples, age at last birthday was one or more years higher for husband than for wife, for 146 couples it was one or more years lower, and for 215 couples it was the same.

age itself. With wives, the frequency of errors varies directly and in important degree with age, increasing from 18.2 per cent at ages 25-29 to 41.1 per cent at ages 40-44 (see Table 5).²¹ Most of the increase is due to understatements of age, especially those of one year. Evidently the popular belief that women tend to forget birthdays as they approach middle life has some foundation in fact. The relation between age of husband and accuracy of reports of age is similar to that for wives, but somewhat smaller and less regular. The frequency of errors is lowest (26.3 per cent) at ages 35-39, and highest (41.7 per cent) at ages 45-52, but only the difference between the percentages for ages 35-39 and 40-44 is very significant statistically. Understatements of one year or of three or more may be somewhat more numerous for those 40 or over than for those younger, and the opposite may be true for overstatements of one year.²²

²¹ The statistical significance of the differences between age groups is as follows: (1) Percentage of correct replies: (a) wife, 25-29 or 30-34 and 35-39 or 40-44, very significant; 35-39 and 40-44, moderately significant; and (b) husband, 35-39 and 40-44, very significant; 35-39 and 45-52, moderately significant. (2) One year too low: (a) wife, 30-34 and 40-44, very significant; 35-39 and 40-44, moderately significant; and (b) husband, 35-39 and 40-44, very significant. (3) One year too high: (a) wife, 35-39 and 40-44, very significant; 25-29 and 35-39, and 30-34 and 40-44 moderately significant.

²² An important proportion of the errors results from a tendency to report age as a round number, beginning between ages 20 and 25. Usually it is a number ending in 0 or 5, but occasionally it is one ending in 2 or 8. If it were not for this tendency, the number of persons of a given age would be approximately 50 per cent of the sum of the number of persons one year older and one year younger. The actual percentages for selected ages (based on the reports for 41,498 native-white couples, each spouse married once only, and wife under 45) are shown below. There is some tendency for rounding to become more frequent as age increases, as may be seen by comparing the percentages at ages 25 and 35, 28 and 38, etc. This explains in part why the frequency of errors in age increases as age increases.

The tendency to report age in round numbers is very much greater in the Survey than in the Census, perhaps because of the official character of the Census, and the very much larger amount of advance publicity which it received, and which called attention to the questions to be asked.

Age	Persons of Specified Age in Per Cent of the Sum of Those One Year Older and Younger	
	Wives	Husbands
25	58.9	59.5
28	55.5	52.9
30	76.4	73.8
32	55.3	55.3
35	66.7	62.4
38	59.4	55.8
40	84.8	80.3
42	55.2	56.2

ACCURACY

Number of Reports

Percentage:

Correct

Grade Too Low

Grade Too High

Grade Too Low

Grade Too High

Grade Too Low

Grade Too High

Grade Too Low

Grade Too High

Grade Too Low

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Highest School Grade Completed. The accuracy of wives', husbands', and relatives' replies to the questions on education is much the same as for the questions on age (*see* Table 3). As before, wives are easily the best informants, with husbands and relatives nearly tied for second place.²² Husbands made fewer errors in reporting wife's education than wife's age and more errors in reporting their own education than age. The opposite is true for relatives. "Others" did much better with education than with age, comparing favorably on the former with relatives.

The highest grade of school completed by themselves was reported too high more than twice as often as too low by both wives and husbands, but there was no bias in the relatives' reports on education of the wives and husbands. Wives were guilty of exaggerating by one grade about as often as all other informants, but not by two or more grades. Part of the upward bias results from the fact that some Survey respondents included training which is not accredited in the regular school and college system, for example in

Table 6. Accuracy of reports of highest school grade completed, by highest grade (all informants).¹

ACCURACY	WIFE						HUSBAND					
	Total	Grade 8	High School 1-3	High School 4	College 1-3	College 4+	Total	Grade 8	High School 1-3	High School 4	College 1-3	College 4+
Number of Reports	1,498	280	440	543	115	120	1,487	389	393	389	131	185
Percentage:												
Correct	76.8	78.6	68.9	82.1	79.1	75.0	71.8	75.8	63.1	74.8	69.5	76.8
-1 Grade Too Low	4.7	5.4	7.3	2.0	1.7	8.3	6.4	5.7	10.4	2.6	6.1	7.6
-2-3 Grades Too Low	2.0	4.3	2.3	1.3	0.9	—	3.6	4.9	5.3	2.0	3.8	—
-4+ Grades Too Low	0.7	3.2	—	0.2	—	—	0.7	1.8	0.5	0.5	—	—
+1 Grade Too High	9.1	7.1	15.9	3.9	15.7	6.7	10.5	10.0	15.5	6.2	13.7	7.6
+2-3 Grades Too High	5.5	1.4	5.5	7.9	2.6	6.7	5.8	1.5	4.6	11.6	4.6	5.9
+4+ Grades Too High	1.3	—	0.2	2.6	—	3.3	1.2	0.3	0.5	2.3	2.3	2.2

¹ See also Table 2, footnote 2.

²² The differences between wives and each of the other groups in the percentage of correct reports on education of wife are very significant statistically; those for education of husband are moderately significant.

business colleges, as nurses, and through correspondence courses. When such cases were brought to light in the Study, the training was omitted in the determination of highest grade, primarily because of the difficulty of evaluating it. Another cause of the upward bias is a tendency for the schooling of one spouse to be exaggerated if the other went further in school. In some such cases the highest grade completed by the latter was reported for the former as well.

No definite relation appears between the highest grade of school completed and the accuracy with which it is reported (*see* Table 6).²⁴ As a rule, however, errors are more frequent for persons who attended high school or college for only one, two, or three years, than for those who graduated. With husbands, the frequency of errors is almost exactly the same for those who stopped after the eighth grade as for those who finished high school or college. With wives, however, the proportion of errors is somewhat lower for high school graduates (17.9 per cent) than for college graduates (25 per cent), but the difference is not significant statistically.

The upward bias in reported education, mentioned above, is found in every group except that composed of persons reported as stopping at the eighth grade. Among the husbands in this group about as many had gone beyond the eighth grade as had failed to complete it, whereas among wives the former exceeded the latter by 3 to 2.²⁵ In contrast, among those reported as completing at least one year of high school, overstatements outnumber understatements by nearly 3 to 1 for wife's education and by nearly 2 to 1 for husband's education. If the comparison is limited to errors of two years or more, the ratios are approximately 5 to 1 and 2.5 to 1, respectively.²⁶

²⁴ Data like those in Table 6, but for wife informants only, are presented in Table 12.

²⁵ Some of the reported eighth graders who had completed one or more years of high school came from communities with only seven grades before high school.

²⁶ Comparisons by class intervals show that incorrect reports of age and education in the Indianapolis Survey are less numerous than "different reports" in the two successive Philadelphia surveys mentioned earlier. Age was reported in the correct interval for 91.2 per cent of the Indianapolis people, and in the same interval for 87.7 per cent of the people

(Continued on page 277)

Rent or Rental Value. Disagreements between the information collected in the Survey and that collected in the Study are much more pronounced in connection with the rent or rental value of a dwelling unit than in connection with the other questions. The first report differs from the second by 5.0 per cent or more for over two-fifths of the wives, half of the husbands, more than half of the relatives, and nearly two-thirds of the "other" informants (see Table 7).⁷⁷ This is by far the worst showing for wives, and somewhat the worst for husbands and relatives, but "others" did better with this question than with age of husband or wife. When large disagreements are considered, however, all groups are found to be much worse informants regarding rent or rental value than for other questions. Understatements of rent or rental value amounting to 25 per cent or more were made by one-tenth of the wives, and by one-fifth of the "others."⁷⁸

If wives' reports for owned and rented dwelling units are considered separately, the frequency of agreements is found to be about the same for rent of rented homes as for age and education, but to be barely half as much for rental value of owned homes (see Table 7).⁷⁹ Such a situation is to be expected. In most cases rent is a stipulated monthly amount, frequently paid by wives, and usually known to them. Rental value, in contrast, is a matter of opinion unless the owner knows the rent of a similar house near-by, or has recently

in both Philadelphia surveys. The two studies disagree to a larger extent as to reports on education, 90.6 per cent of those in the Indianapolis Survey being in the correct class interval, but only 77.8 per cent of those in the two Philadelphia surveys being in the same class interval. In order to compare accurately the percentage of *different* reports in the Philadelphia study with the percentage of *incorrect* reports in the Indianapolis Study it is necessary to know the frequency with which a specific question was answered the same for each person (either correctly or with an identical mistake) in both Philadelphia surveys.

⁷⁷ The difference between wives and "others" in the percentage of replies agreeing within 4.9 per cent is very significant, but the other differences are not significant statistically. Reports disagreeing by 0.1 to 4.9 per cent are rare, only 1.6 per cent of the total number.

⁷⁸ The differences by informant are too small to be statistically significant for the number of schedules involved.

⁷⁹ Among all informants, agreement within 4.9 per cent is found for 70.6 per cent of renters and 37.0 per cent of the owners.

Table 7. Agreement between reports of rent, or rental value, by informant, and for wife informants by tenure and length of intervening interval.¹

ACCURACY AND TENURE	INFORMANT				
	Total	Wife	Husband	Relative	Other
Number of Reports	1,055	857	92	67	39
<i>Percentage:</i>					
Agreeing Within 4.9 Per Cent	55.7	58.0	(50.0)	(46.3)	(35.9)
Too Low by 5.0-14.9 Per Cent	14.1	14.1	(13.0)	(13.4)	(17.9)
Too Low by 15-24.9 Per Cent	7.6	7.1	(9.8)	(7.5)	(12.8)
Too Low by 25+ Per Cent	11.1	10.0	(15.2)	(13.4)	(20.5)
Too High by 5.0-14.9 Per Cent	6.8	6.3	(8.7)	(10.4)	(7.7)
Too High by 15+ Per Cent	4.6	4.4	(3.3)	(9.0)	(5.1)
LENGTH OF INTERVENING INTERVAL					
	Total	Less Than 2 Months	2-2.9 Months	3-3.9 Months	4 or More Months
<i>Wife Informants, Owners</i>					
Number of Reports	381	128	103	69	81
<i>Percentage:</i>					
Agreeing Within 4.9 Per Cent	38.8	50.8	31.1	(31.8)	(35.8)
Too Low by 5.0-14.9 Per Cent	17.1	10.2	18.4	(21.7)	(22.2)
Too Low by 15-24.9 Per Cent	10.0	7.0	9.7	(10.1)	(14.8)
Too Low by 25+ Per Cent	17.1	12.5	20.4	(18.8)	(18.5)
Too High by 5.0-14.9 Per Cent	10.0	11.7	10.7	(10.1)	(6.2)
Too High by 15+ Per Cent	7.1	7.8	9.7	(7.2)	(2.5)
<i>Wife Informants, Renters</i>					
Number of Reports	475*	184	110	80	100
<i>Percentage:</i>					
Agreeing Within 4.9 Per Cent	73.3	77.2	73.6	(65.0)	72.0
Too Low by 5.0-14.9 Per Cent	11.8	6.0	14.5	(18.8)	14.0
Too Low by 15-24.9 Per Cent	4.8	4.9	4.5	(7.5)	3.0
Too Low by 25+ Per Cent	4.4	4.3	3.6	(5.0)	5.0
Too High by 5.0-14.9 Per Cent	3.4	4.9	—	(3.8)	4.0
Too High by 15+ Per Cent	2.3	2.7	3.6	—	2.0

¹ Percentages based on fewer than one hundred reports are shown in parentheses. See also Table 2, footnotes 3 and 4.

* Includes one case with length of intervening interval not stated.

bought the property, refused offers, or tried to sell.⁴⁰ Furthermore, rent is commonly established for several months or a year in advance, whereas opinions as to rental value can change at will.

The greater frequency and size of the disagreements between the successive reports on rent or rental value could result from the rise in rents and property values which presumably occurred during the weeks or months that elapsed between the Survey and the Study. An allowance for the time lag was made with the other questions where it was needed,⁴¹ but was impracticable in this case. A classification of wife informants by the number of months between the two interviews (Table 7) shows clearly that there is a small direct relationship between this factor and the frequency of disagreements for rented homes, and a somewhat larger one for owned homes. The proportion of reports agreeing is highest when the interval is less than two months (77.2 per cent for renters and 50.8 per cent for owners). Irregular fluctuations occur between longer interval groups, the percentage of reports agreeing closely varying between 65.0 and 73.6 per cent for renters and between 31.1 and 35.8 per cent for owners.⁴² These figures indicate that even if the two reports on rental value had referred to the same date and the effect of the real estate boom were thus removed, the information about rental value would still be much less accurate than that about the other items included in the Survey.⁴³

⁴⁰ In an important proportion of cases in the Survey the informant estimated the probable market price of the dwelling unit, and the monthly rental value was computed as 0.8 per cent of this figure.

⁴¹ These are number of live births and living children, age, and years lived since marriage in a city of 25,000 or more.

⁴² The statistical significance of the differences in the proportions agreeing within 4.9 per cent is as follows: (1) Owners: (a) less than 2 months and 2-2.9 or 3-3.9 months, very significant; and (b) less than 2 months and 4 or more months, moderately significant. (2) Renters: no difference significant.

⁴³ A minor reason for the more frequent and larger disagreements with this question than with others could be the fact that the canvassers were instructed to estimate the rent or rental value if it could not be secured from the respondent and if there were similar dwelling units near-by for which the facts were reported by the occupants. Since the number of canvassers' estimates is very small relatively, however, they are believed to have no appreciable effect on the frequency and size of disagreement.

Table 8. Accuracy of wives' reports on one item by accuracy of their reports on other items.¹

QUESTION AND ACCURACY	NO. OF REPORTS ²	YEAR OF MARRIAGE		YEARS IN LARGE CITIES		AGE OF WIFE		AGE OF HUSBAND		HIGHEST SCHOOL GRADE			
		Cor- rect	In- correct	Cor- rect	In- correct	Cor- rect	In- correct	Cor- rect	In- correct	Cor- rect	In- correct	WIFE	HUSBAND
<i>Year of Marriage</i>													
Correct	1,055	—	—	89.0	11.0	79.8	20.2	75.8	24.2	81.4	18.6	74.9	25.1
Incorrect	139	—	—	87.0	13.0	71.0	29.0	66.1	33.9	75.2	24.8	68.1	31.9
<i>Years in Large Cities</i>													
Correct	1,031	89.6	10.4	—	—	78.8	21.2	75.3	24.7	80.5	19.5	74.9	25.1
Incorrect	133	87.7	12.3	—	—	83.7	16.3	74.4	25.6	82.0	18.0	69.5	30.5
<i>Age of Wife</i>													
Correct	928	90.5	9.5	88.1	11.9	—	—	81.3	18.7	83.1	16.9	76.1	23.9
Incorrect	249	85.5	14.5	91.1	8.9	—	—	50.2	49.8	71.5	28.5	67.3	32.7
<i>Age of Husband</i>													
Correct	876	90.8	9.2	88.8	11.2	85.8	14.2	—	—	81.2	18.8	75.0	25.0
Incorrect	296	86.1	13.9	88.4	11.6	58.4	41.6	—	—	79.3	20.7	71.9	28.1
<i>Highest School Grade, Wife</i>													
Correct	949	90.4	9.6	88.6	11.4	81.4	18.6	75.2	24.8	—	—	78.1	21.9
Incorrect	228	86.7	13.3	89.6	10.4	69.0	31.0	72.9	27.1	—	—	58.0	42.0
<i>Highest School Grade, Husband</i>													
Correct	865	90.6	9.4	89.5	10.5	80.8	19.2	75.4	24.6	85.0	15.0	—	—
Incorrect	303	87.3	12.7	86.6	13.4	73.2	26.8	72.2	27.8	68.7	31.3	—	—

¹ Percentages relate to accuracy of replies to questions at the top for wives replying correctly or incorrectly to questions at the left.² This column shows the number and correct and incorrect reports for the questions listed at the left. When these are classified by the questions in the column headings, the number is reduced somewhat. The maximum reduction in the number of correct reports is 25 (highest school grade of wife by years in large cities) and that in the number of incorrect reports is 20 (year of marriage by the highest school grade of husband). See also Table 2, footnote 2.

It is interesting to note that for the interval of less than two months the ratio of understatements to overstatements is a little higher for tenants (2.0 to 1) than for owners (1.5 to 1). Apparently the proverbial fear of owners that stating the true value of their property would mean higher taxes did not bias their replies in the Survey. For the interval four or more months, in contrast, the ratio of understatements to overstatements is higher for owners than for renters. Apparently the proportion of tenants whose rent was raised between the Survey and the Study is smaller than the proportion of owners who thought that real estate values were rising.

Survey and Study reports on rent or rental value agree less frequently if the husband rather than the wife was the Survey informant. Such a situation is to be expected when it is remembered that the rent or value question in the Study was answered by the wife as a rule. Although rental value of owned homes must be an estimate in most cases, the difference between estimates on dates one to six months apart should be smaller if the same person is the informant at both times than if there is a change in the informant.

Interrelation of Errors. If a respondent gives an incorrect report on one item, is she (or he) likely to give an incorrect report on another item? If all informants are considered, an affirmative answer would be expected since it has been shown that for most questions the frequency of errors is highest for "other" informants and lowest for wives. To analyze the question more precisely, attention will be confined to the reports of wives.

On the whole, the wives who answered incorrectly one of the six questions for which errors were most frequent⁴⁴ were more likely than the other wives to give an incorrect answer to one or more of the other five questions. This may be seen by examining Table 8, which shows the wives reporting correctly and incorrectly for each

⁴⁴ The six questions relate to year of marriage, years in large cities, and age and education of wife and husband. Rent or rental value of dwelling unit is omitted from this analysis since for home owners it is usually a matter of opinion rather than fact.

item, classified by the accuracy of their reports for each other item. Among the thirty combinations in the table, all but four follow the rule.⁴⁸ The most striking case relates to the reports on age. Of the wives who reported their own age correctly 81.3 per cent reported their husband's age correctly. In contrast, of the wives who misstated their own age, only 50.2 per cent gave their husband's age correctly. A similar situation is found in the reports on highest grade of school completed. The right answer as to their husbands' education was given by 78.1 per cent of the wives who correctly reported their own educational attainment but by only 58.0 per cent of the others. The four exceptions to the rule involve "years in

Table 9. Actual percentage distribution of wives by number of errors in replies to six questions and random distribution that would result from chance if there were no interrelation of errors.

PERCENTAGE DISTRIBUTION CONSIDERED	NO ERROR	ONE ERROR	TWO ERRORS	THREE ERRORS	FOUR ERRORS	FIVE ERRORS	SIX ERRORS
<i>All Cases</i>							
Actual ¹	35.1	33.4	20.1	8.7	2.2	0.4	0.1
Random ²	17.6	40.1	23.7	7.3	1.2	0.1	*
<i>One or More Errors</i>							
Actual	—	51.5	31.0	13.4	3.4	0.6	0.1
Random	—	55.4	32.7	10.1	1.7	0.1	*
<i>Two or More Errors</i>							
Actual	—	—	63.8	27.6	7.0	1.3	0.3
Random	—	—	73.4	22.6	3.7	0.3	*

¹ Based on distribution of 1,127 wives reporting on all six questions in both the Survey and Study.

² Computed from the percentage of correct and incorrect replies to each of the six questions.

* Less than 0.05 per cent.

⁴⁸ In comparing wives answering one question correctly with those answering it incorrectly, the statistical significance of the difference in the proportion answering other questions incorrectly is as follows: (a) very significant: age of wife and age of husband, age of wife and highest school grade of wife or husband, and highest school grade of wife and that of husband; and (b) moderately significant: year of marriage and age of wife, and year of marriage and age of husband.

Only three of the fifteen correlation coefficients computed for correct and incorrect replies to pairs of questions exceed ± 0.10 , namely, age of wife and age of husband ($.29 \pm .03$), age of wife and education of wife ($.12 \pm .03$), and education of wife and education of husband ($.18 \pm .03$).

large cities," and probably are due in part, if not wholly, to the wording of the question.⁴⁶ In none of these cases is the difference large.

The tendency for errors to be concentrated in particular respondents may also be seen by comparing the actual distribution of wives by number of errors in replies to the six questions with the random distribution that would occur from chance alone. As shown in Table 9 the actual percentage of wives making no error (35.1) is over one-fifth above the percentage of a chance relationship (27.6). Among those making one or more errors, the actual percentage making *only* one (51.5) is somewhat below that based on random distribution (55.4). Among those making at least two errors, the actual percentage making *only* two (63.8) is much further below the random (73.4). Apparently, therefore, the tendency for errors in the reports of wives to be concentrated in certain individuals is of some importance.⁴⁷

ACCURACY OF WIVES' REPORTS, BY SOCIO-ECONOMIC STATUS

A question commonly raised in discussions of the reliability of data like those under consideration is whether accuracy varies with the socio-economic status of the respondent. In an attempt to obtain a partial answer, the information collected has been classified by the three measures of socio-economic status available from the Survey, namely, tenure, rent or rental value of home, and highest grade of school completed. Because of the great variation between informants in accuracy of reports, and because nearly 80 per cent of the Survey informants were wives, it is desirable to eliminate this variable and confine this section to reports made by wives.

⁴⁶ Some wives whose reply "Yes" to the question "Have you lived all the time since marriage in a city of 25,000 or more?" was correct, would not have answered correctly if the question had been worded "How many years since marriage have you lived in a city of 25,000 or more?"

⁴⁷ A somewhat greater tendency probably would be shown if in forty-one cases the interviewers had not failed to complete the first Study schedule when the wife gave information differing sufficiently from that obtained in the Survey to make the couple ineligible for the Study.

By Tenure. Tenure is the first measure of socio-economic status that will be considered. In part it measures financial standing, since the Survey as a whole shows the proportion of owners increasing from 8.4 per cent in the rental-value group under \$15 to 83.2 per cent in the rent or value group \$80 or more, and the median monthly rental value of owned homes to be about \$38 but the median rent paid by tenants to be about \$28.⁴⁰ In part it probably measures stability and a willingness to assume responsibility.

The differences between owners and renters in accuracy of information collected are small, but except for the question on rent or value of dwelling unit (discussed previously and shown in Table 7), they all favor owners (*see* Table 10). The largest difference in the proportion of correct replies relates to highest grade of school completed by wife, 83.5 per cent of the wives of owners reporting

Table 10. Accuracy of wives' reports, by question and tenure.¹

ACCURACY	TOTAL ²	OWNER	RENTER	TOTAL ²	OWNER	RENTER	TOTAL ²	OWNER	RENTER
	YEAR OF MARRIAGE			YEARS IN LARGE CITIES			AGE OF WIFE		
Number of Reports	1,194	507	676	1,164	493	660	1,177	503	664
Percentage:									
Correct	88.4	90.3	87.0	88.6	90.5	87.1	78.8	79.5	78.5
1 Year Too Low	2.2	1.6	2.7	1.8	1.4	2.1	7.8	8.0	7.7
2+ Years Too Low	1.1	0.6	1.3	2.1	2.2	2.1	3.1	2.4	3.5
1 Year Too High	6.4	5.7	7.1	2.1	2.4	1.7	8.4	8.7	8.1
2+ Years Too High	1.9	1.8	1.9	5.4	3.5	7.0	1.9	1.4	2.3
ACCURACY	AGE OF HUSBAND			HIGHEST SCHOOL GRADE, WIFE			HIGHEST SCHOOL GRADE, HUSBAND		
Number of Reports	1,172	501	661	1,177	502	665	1,168	497	661
Percentage:									
Correct	74.7	75.0	74.7	80.6	83.5	78.3	74.1	76.1	72.6
1 Year (Grade) Too Low	9.0	9.0	9.1	3.5	3.6	3.5	6.3	6.6	5.9
2+ Years (Grades) Too Low	3.1	2.8	3.3	2.0	2.0	2.1	3.6	3.4	3.5
1 Year (Grade) Too High	9.9	10.2	9.5	9.0	7.8	9.9	10.4	9.1	11.6
2+ Years (Grades) Too High	3.2	3.0	3.3	4.8	3.2	6.2	5.7	4.8	6.4

¹ See Table 2, footnote 2.

² Includes "unknown tenure" and cases not coded as owners or renters.

⁴⁰ These figures are based on the Survey reports for 12,139 owners and 28,031 renters (native-white couples with the wife under 45 and neither spouse married more than once).

correctly and 78.3 per cent of the wives of renters.⁴⁹ With age of husband, however, the two percentages vary by only 0.3. If the results for the six questions are combined, the average percentage correct is 82.5 per cent for owners and 79.7 for renters, but the difference of 2.8 is too small to be important.

By Rent or Rental Value of Home. Variations between rent or rental-value groups in the accuracy of replies to the questions under consideration are slightly larger than those between tenure groups, but show no consistent trend. The percentage of correct reports on age of wife and age of husband is highest in the \$20-29 group, but in neither case is it as much as nine points above the lowest percentage (see Table 11). Highest grade of school completed by wife was reported most accurately by wives in the \$30-39 group (82.6 per cent correct) and least accurately by those in the under \$20 group (79.6 per cent correct), but the difference is not significant. The fewest mistakes in stating education of husband and year of marriage are found in the \$60 or more group, and the most in the under \$20 group, the differences in the percentage correct being 7.4 and 7.0, respectively. Finally, the \$40-59 group ranks first (91.9 per cent) in reporting correctly years lived in large cities, and the under \$20 group again ranks last (84.5 per cent).⁵⁰

The nearest approach to a consistent relationship between groups is the superior accuracy of the \$20-29 group compared with the under \$20 group. The former outranks the latter for each of the six questions considered above. If the data for the six questions are combined, the percentage correct is 82.3 and 78.7, respectively, for the two groups, and the difference of 3.6 is too small to be of much importance.⁵¹

⁴⁹ This difference is moderately significant statistically but the others are not.

⁵⁰ The following differences between rental groups in the proportion of correct replies are moderately significant statistically: (a) age of wife: \$20-29 and under \$20 or \$40-59; (b) age of husband: \$20-29 and \$30-39; and (c) years lived in large cities: under \$20 and \$40-59.

⁵¹ In view of the tendency for errors to be concentrated in certain respondents this difference may not be significant statistically.

The relation between rent or rental value and the agreement of successive reports of this item needs to be considered by tenure, since, as mentioned earlier, the reports of owners differ decidedly more

Table 11. Accuracy of wives' reports, by question and rent or rental value of home.¹

ACCURACY	TOTAL	UNDER \$20	\$20-29	\$30-39	\$40-59	\$60+	TOTAL	UNDER \$20	\$20-29	\$30-39	\$40-59	\$60+
	YEAR OF MARRIAGE						YEARS IN LARGE CITIES					
Number of Reports	1,194	244	293	326	226	90	1,164	238	284	318	222	88
Percentage:												
Correct	88.4	85.2	87.7	90.5	88.5	(92.2)	88.6	84.5	89.8	88.1	91.9	(88.6)
1 Year Too Low	2.2	2.9	1.0	2.5	3.1	(1.1)	1.8	2.5	1.8	1.6	0.9	(3.4)
2+ Years Too Low	1.1	2.5	1.4	0.3	—	(1.1)	2.1	3.8	1.4	2.5	1.4	(1.2)
1 Year Too High	6.4	8.2	6.8	5.5	6.2	(4.4)	2.1	1.3	2.5	2.8	1.8	—
2+ Years Too High	1.9	1.2	3.1	1.2	2.2	(1.1)	5.4	8.0	4.6	5.0	4.1	(6.8)
	AGE OF WIFE						AGE OF HUSBAND					
Number of Reports	1,177	239	291	319	224	90	1,172	239	290	318	222	90
Percentage:												
Correct	78.8	77.0	83.8	78.1	75.0	(80.0)	74.7	73.6	79.0	71.4	76.1	(73.3)
1 Year Too Low	7.8	8.4	4.8	8.8	10.3	(6.7)	9.0	9.6	8.3	10.4	6.8	(11.1)
2+ Years Too Low	3.1	2.5	3.4	3.1	3.6	(1.1)	3.1	2.1	3.8	2.8	1.4	(2.2)
1 Year Too High	8.4	8.4	6.9	8.8	9.8	(8.9)	9.9	10.9	7.2	12.3	8.6	(10.0)
2+ Years Too High	1.9	3.8	1.0	1.3	1.3	(3.3)	3.2	3.8	1.7	3.1	4.5	(3.3)
	HIGHEST SCHOOL GRADE, WIFE						HIGHEST SCHOOL GRADE, HUSBAND					
Number of Reports	1,177	240	290	321	223	90	1,168	239	289	318	220	89
Percentage:												
Correct	80.6	79.6	79.7	82.6	79.8	(81.1)	74.1	72.4	74.0	74.5	73.2	(79.4)
1 Year Too Low	3.5	3.3	3.8	3.1	4.0	(3.3)	6.3	5.4	6.9	5.3	8.6	(3.4)
2+ Years Too Low	2.0	1.3	2.1	1.9	3.1	(2.2)	3.6	3.8	2.8	2.5	4.5	(5.0)
1 Year Too High	9.0	11.3	9.0	7.5	9.9	(6.7)	10.4	14.2	9.7	10.7	7.7	(9.0)
2+ Years Too High	4.8	4.6	5.5	5.0	3.1	(6.7)	5.7	4.2	6.6	6.9	5.9	(2.2)
	RENTAL VALUE, OWNERS						RENT PAID, TENANTS					
Number of Reports	381	108	128	92	53		475	145	149	112		69
Percentage:												
Agreeing Within 4.9%	38.8	31.5	41.4	(37.0)	(50.9)		73.3	70.3	77.9	74.1		(68.1)
Too Low by 5-14.9%	17.1	10.2	21.1	(21.7)	(13.2)		11.8	12.4	10.1	12.5		(13.0)
Too Low by 15-24.9%	10.0	8.3	13.3	(10.9)	(3.8)		4.8	6.2	4.7	4.5		(2.9)
Too Low by 25+%	17.1	31.5	8.6	(14.1)	(13.2)		4.4	7.6	3.4	1.8		(4.3)
Too High by 5-14.9%	10.0	10.2	7.0	(13.0)	(11.3)		3.4	1.4	2.0	4.5		(8.7)
Too High by 15+%	7.1	8.3	8.6	(3.3)	(7.5)		2.3	2.1	2.0	2.7		(2.9)

¹Specific rental value groups are restricted to cases coded as owners and renters but totals are not so restricted. Percentages based on fewer than one hundred reports are shown in parentheses. See also Table 2, footnotes 2, 3, and 4.

often and in greater degree than the reports of renters, and there is an important direct relationship between rent or rental value and the proportion of owned homes. Among owners, agreements are least frequent for those whose homes have a rental value of less than \$30,³³ and most frequent for those whose homes have a rental value of \$60 or more. Only disagreements of 25 per cent or over, however, are much more frequent in the low than in the high rental-value group.³⁴ The other two rental-value groups occupy an intermediate position on the whole; nevertheless, they have a somewhat larger proportion of reports too low by 5-14.9 per cent and by 15.0-24.9 per cent.³⁵ Obviously there is no consistent relationship between rental value of owned homes and the accuracy of the value reported by wives, but there are indications of a slight direct relation.

Among couples renting their homes, agreement between successive reports on rent is most frequent for those in the \$20-29 group and least frequent in the \$40+ group, but the differences between these groups are not statistically significant. A comparison of the \$20-29 group with the higher rental groups brings out a slight tendency toward an inverse relationship between rent and accuracy of reports of rent, but here again the differences are small.³⁶

By Education of Wife. Variations in accuracy of reports by highest grade of school completed by wife are somewhat larger than those by tenure, or by rent or rental value of home; nevertheless, they show no consistent relation (*see* Table 12). Year of marriage

³³ Almost two-thirds of the owned homes with a rental value of less than \$30 are in the \$20-29 group.

³⁴ The difference between the groups in the percentage of replies (a) agreeing within 4.9 per cent is moderately significant statistically; and (b) too low by 25 per cent or more is very significant statistically.

³⁵ The following differences are of statistical significance: (1) too low by 5-14.9 per cent: under \$30 and \$30-39 or \$40-59, moderately significant; (2) too low by 15-24.5 per cent: \$30-39 and \$60 or more, moderately significant; and (3) too low by 25 per cent or more: under \$30 and \$30-39 or \$40-59, very significant.

³⁶ The greater frequency of reports (a) 25 per cent or more too low in the under \$20 group than in the \$30-39 group, and (b) 5-14.9 per cent too high in the \$60 or more group than in the under \$20 group, is "moderately significant" statistically.

Table 12. Accuracy of wives' reports, by question and highest grade of school completed.¹

ACCURACY	YEARS OF MARRIAGE					YEARS LIVED IN LARGE CITIES				
	TOTAL ¹	GRADE 8	HIGH SCHOOL 1-3	HIGH SCHOOL 4	COLLEGE 4+	TOTAL ³	GRADE 8	HIGH SCHOOL 1-3	HIGH SCHOOL 4	COLLEGE 4+
Number of Reports	1,194	221	384	416	97	1,164	214	375	407	73
Percentage:										
Correct	88.4	80.1	84.4	90.9	(91.8)	88.6	87.4	92.0	85.3	(87.4)
1 Year Too Low	2.2	2.3	2.3	2.2	(1.0)	1.8	2.8	0.8	2.7	(1.4)
2+ Years Too Low	1.1	0.5	1.8	1.0	(1.0)	2.1	2.6	1.3	3.2	(1.1)
1 Year Too High	6.4	5.9	10.2	3.6	(6.2)	2.1	2.3	1.6	2.2	(1.4)
2+ Years Too High	1.9	2.3	1.3	2.4	(4.0)	5.4	4.7	4.3	6.6	(2.7)
AGE OF WIFE										
Number of Reports	1,177	217	380	410	97	1,172	216	378	409	72
Percentage:										
Correct	78.8	79.7	77.4	80.2	(79.4)	74.7	76.9	75.9	74.8	(71.1)
1 Year Too Low	7.8	5.1	8.7	8.5	(6.2)	9.0	6.5	9.3	9.0	(10.3)
2+ Years Too Low	3.1	3.7	2.4	2.7	(4.1)	3.1	2.3	2.6	3.4	(2.1)
1 Year Too High	8.4	8.8	9.7	7.1	(8.2)	9.9	12.5	9.0	9.0	(11.3)
2+ Years Too High	1.9	2.8	1.8	1.5	(2.1)	3.2	1.9	3.2	3.7	(2.8)
HIGHEST SCHOOL GRADE, WIFE										
Number of Reports	1,177	219	378	411	96	1,168	216	375	408	73
Percentage:										
Correct	80.6	84.9	71.4	85.6	(84.4)	74.1	75.0	72.3	74.3	(72.9)
1 Grade Too Low	3.5	2.3	6.3	1.5	(1.0)	6.3	4.2	7.7	5.6	(11.5)
2+ Grades Too Low	2.0	5.5	2.1	1.0	—	3.6	4.6	2.1	4.7	(2.1)
1 Grade Too High	9.0	6.4	15.6	4.1	(12.5)	10.4	11.1	13.6	7.8	(9.4)
2+ Grades Too High	4.8	0.9	4.5	7.8	(5.5)	5.7	5.1	4.3	7.6	(4.2)
HIGHEST SCHOOL GRADE, HUSBAND										
Number of Reports	1,177	219	378	411	96	1,168	216	375	408	73
Percentage:										
Correct	80.6	84.9	71.4	85.6	(84.4)	74.1	75.0	72.3	74.3	(72.9)
1 Grade Too Low	3.5	2.3	6.3	1.5	(1.0)	6.3	4.2	7.7	5.6	(11.5)
2+ Grades Too Low	2.0	5.5	2.1	1.0	—	3.6	4.6	2.1	4.7	(2.1)
1 Grade Too High	9.0	6.4	15.6	4.1	(12.5)	10.4	11.1	13.6	7.8	(9.4)
2+ Grades Too High	4.8	0.9	4.5	7.8	(5.5)	5.7	5.1	4.3	7.6	(4.2)
RENTAL VALUE, OWNERS										
Number of Reports	381	54	115	140	72	475	90	175	160	50
Percentage:										
Agreeing Within 4.9%	38.8	(46.3)	32.2	37.9	(45.8)	73.3	(70.0)	76.6	70.0	(78.0)
Too Low by 5-14.9%	17.1	(9.3)	18.3	20.7	(13.9)	11.8	(14.4)	9.7	14.4	(6.0)
Too Low by 15-24.9%	10.0	(3.7)	12.2	12.1	(6.9)	4.8	(7.8)	3.4	4.4	(4.0)
Too Low by 25+%	17.1	(22.2)	17.4	14.3	(18.1)	4.4	(2.2)	4.6	5.6	(6.0)
Too High by 5-14.9%	10.0	(11.0)	12.2	9.3	(6.9)	3.4	(1.1)	3.4	3.8	(6.0)
Too High by 15+%	7.1	(7.4)	7.8	5.7	(8.3)	2.3	(4.4)	2.3	1.9	—

¹ Percentages based on fewer than one hundred reports are shown in parentheses. See also Table 2, footnotes, 2, 3, and 4.

was reported somewhat less accurately by wives with one to three years in high school than by those with more or less schooling, owing chiefly to a greater tendency to mention one year too late.⁶⁶ Somewhat larger variations are found in the reports on years lived in a large city since marriage but even so the lowest percentage correct (85.3 for the "High School 4" group) is only 9.2 below the highest percentage (94.5 for the "College 4+" group).⁶⁷ Moreover, the rank order of the groups is not the same for the two questions.

Variations in accuracy by education are smaller for reports on age of wife. For this item the "High School 4" group has the highest percentage correct (80.2) and the "College 4+" group the lowest (73.6). There may be a slight tendency, however, for accuracy of wives' reports on age of husband to vary inversely with her educational status. There is a gradual decline in the percentage correct from 76.9 for the "Grade 8" wives to 67.7 for the "College 4+" wives, chiefly because of a gradual increase in the percentage one year too low from 6.5 to 13.9, but each of the differences is too small to be significant.

Wife's education does not seem to have much influence on the accuracy of her reporting the highest grade of school she completed, except for the "High School 1-3" group.⁶⁸ These wives are well below the others (10.8 to 14.2 points) in the percentage of correct replies, but most of the extra errors are of only one grade. With respect to education of husband, in contrast, the "College 4+" group leads by

⁶⁶ The difference in the proportion of correct reports between the "High School 1-3" and "High School 4" groups is very significant statistically; that between the former and the "College 1-3" group is moderately significant. The difference in the proportion of reports of marriage one year too late between the "High School 1-3" and the "High School 4" group is very significant statistically; that between the former and the "College 4+" group is moderately significant.

⁶⁷ The following differences between groups in the percentage of correct reports of years lived in large cities are (a) very significant statistically: "High School 4" and "High School 1-3" or "College 4+"; and (b) moderately significant statistically: "Grade 8" and "College 4+."

⁶⁸ Each of the differences is very significant statistically except that between "High School School 1-3" or "College 4+," which is moderately significant.

5.8 to 8.5 in the percentage of correct reports, but the "High School 1-3" wives are only slightly below the other three groups.

The percentage of reports regarding rental value of owned homes which agree within 4.9 per cent fluctuates widely between educational groups, declining from 46.3 per cent for the "Grade 8" wives to 32.2 per cent for the "High School 1-3" wives, and then rising to 45.8 per cent for the combined "College" group. In spite of this, the frequency of large understatements (25 per cent or more) is greatest in the "Grade 8" group, and second in the "College" group. But because of the small number of wives in each group (between 54 and 140) these differences in percentages are not significant statistically. If the wives are subdivided into two groups, namely, Less Than High School 4, and High School 4 or More, the percentage of reports on rental value agreeing within 4.9 per cent is 36.7 and 40.6, respectively, and the difference is too small to be important. Tenant wives' reports on rent vary less widely and less regularly with education of wife. If only two groups are used (Less Than High School 4, and High School 4 or More) the percentages are 74.3 and 71.9, and the difference is too small to be important.

If the results for the first six questions considered in this section are combined, the percentage correct varies only from a low of 78.9 for "High School 1-3" wives to a high of 82.2 for "Grade 8" wives. If rent or value is included, the same two groups are still at the extremes, but the percentages are lowered to 76.5 and 80.0, respectively.⁹⁹ It is clear, therefore, that among wives completing at least the eighth grade, the variations between education groups in accuracy of replies in the Survey follow no regular pattern and are generally of small consequence. This finding is in agreement with Palmer's broader conclusion based upon the Philadelphia surveys, namely, "there was no consistent relationship between variability of response and a worker's . . . education . . ."¹⁰⁰

⁹⁹ In view of the tendency for errors to be concentrated in certain respondents, these differences may not be significant statistically.

¹⁰⁰ *Op. cit.*, p. 150.

SUMMARY AND CONCLUSIONS

In the Household Survey of Indianapolis, as in the Federal Census of Population and Housing, and many other studies, a limited number of relatively simple questions were asked of some person in the household. Since it is difficult in most of these cases to check the completeness of coverage, and the accuracy of the information gathered, it is hoped that an analysis of these matters for the Survey may have broader implications.

A block-by-block comparison of the number of dwelling units in the 4,219 blocks covered by both the Survey and the Census of Housing, and a recheck of most of the 208 blocks with no colored residents for which the two counts differ by ten or more dwelling units, indicate that the completeness of coverage of the Survey is approximately 99.5 per cent.

The accuracy of the information gathered from 1,545 couples in the Survey can be tested by comparing it with that gathered a few weeks later in the intensive Study of Social and Psychological Factors Affecting Fertility. The restriction of the Study to couples meeting certain requirements as to age, education, religious preference, number of times married, year of marriage, and length of residence in large cities eliminates the possibility of finding certain types of errors concerning these items but should have little influence on the percentage of correct replies to most of the questions under consideration. Because of the slight relation found between accuracy of information about a couple and the number of live births to that couple, it is not necessary to adjust for the sampling by parity which was done in the Study.

According to the Indianapolis Survey, reports on the number of wife's children living, whether the husband or wife was married previously, and his or her religious preference (by broad religious groups) can be obtained with a high degree of accuracy (98 per cent or better), and nearly as well from a neighbor as from the wife

or husband. With such questions the correct answer usually is obvious, or one category is so large that a respondent who does not know will guess correctly in most cases. Nearly as high a degree of accuracy (95 per cent or better) can be obtained in reports on number of live births to wife, and state of birth of wife and husband, but with the last two questions the frequency of error is substantially greater for "other" respondents than for wives, husbands, or relatives in the home.

Data on such matters as year of marriage, years lived since marriage in cities of 25,000 or more, age of wife and husband, highest school grade completed by wife and husband, and rent paid for a rented dwelling unit are less satisfactory (70.4 to 88.0 per cent correct in the Indianapolis Survey). These questions should be asked of wives if possible and not of neighbors, for a large majority (as high as 80 per cent) of the latter may give erroneous information on one or more such questions, and an important proportion of the errors may be large. With a question like monthly rental value of an owned home, which usually is a matter of opinion rather than of fact, a large majority of wives (61.2 per cent in this case) may give a report in a survey which *differs* by at least 5 per cent from their more considered report in an intensive study.

Wives report their own age about as accurately as that of their husbands, and with overstatements about as numerous as understatements. There is a strong tendency in this Survey (much stronger than in the Census) to report age as a round number, beginning between ages 20 and 25 and increasing somewhat thereafter. Incorrect reports of age also increases somewhat as age increases, in part because of the foregoing relationship.

There is a strong upward bias in the reports by wives and husbands on highest grade of school completed, overstatements outnumbering understatements by more than two to one.

Errors tend to be concentrated in certain individuals within a given group of respondents (wives in this case). Thus, as between

wives who answer a given question correctly and those who answer it incorrectly, the latter are more likely to answer other questions incorrectly.

Wives of home owners probably give somewhat more accurate information than wives of renters. The difference in the frequency of errors in this Survey are not large, but are consistently in favor of the owners for all questions except rent or rental value of home (which is a stipulated amount for renters but usually a matter of opinion for owners).

Variations between rent or rental value groups in the accuracy of wives' replies are slightly larger than between tenure groups, but show no consistent relationship except a possible tendency for errors to be most frequent in the under \$20 group. Variations between educational groups are still larger, but are even more erratic.

The Survey carried out its primary function (to locate couples for the Study) with a fair degree of success. Among the 1,545 couples whose apparent eligibility was tested in the Study, 223 (14.4 per cent) were found to be ineligible, leaving 1,322 couples actually eligible. On the basis of estimates described in the Appendix, it appears probable that this group would be increased by 96 to 114 (7.3 to 8.6 per cent) if it included couples actually eligible but appearing ineligible because of errors in the Survey data.

APPENDIX

RELATION OF ERRORS IN THE SURVEY TO ELIGIBILITY OF COUPLES FOR THE STUDY

As indicated at the outset of this paper the primary purpose of the Survey was to locate couples meeting the requirements for the Study. If the information obtained in the Survey was incorrect in sufficient degree some of the couples who appeared to be eligible were ineligible, and some who appeared to be ineligible were eligible. It is important to consider the size of these two groups.

Among the 1,545 couples who answered most or all of the questions on

the first schedule (Form A) of the Study, all of whom were classified as eligible according to the Survey schedules, 224 were found to be ineligible because some of the entries on the latter were wrong. An incorrect report of year of marriage caused the misclassification of 86 of these couples, more than twice as many as an incorrect report on any other item (see Appendix Table 1). Next in frequency are the exaggerated reports of education of husband (41 couples), followed in order by misstatements regarding length of residence in large cities, education of wife, and previous marriage of husband or wife. Each of the latter caused the misclassification of 25 to 32 couples. If this ranking is compared with that based on the frequency of errors of all types (including those which did not cause misclassification as to eligibility) certain differences are striking. Thus, age of husband is tenth on the former but first on the latter, while year of marriage is first and fifth, respectively. At the other extreme, education of husband ranks second and education of

Appendix Table 1. Errors on Survey schedules which affected classification as to eligibility for Study, by question, and by number of errors per schedule.

QUESTION	COUPLES APPARENTLY ELIGIBLE BUT ACTUALLY INELIGIBLE BECAUSE OF: ¹		COUPLES APPARENTLY INELIGIBLE BUT ACTUALLY ELIGIBLE BECAUSE OF: ²	
	One Error	Two or More Errors ³	One Error	Two or More Errors
TOTAL FOR QUESTIONS CONSIDERED	183	89	87-101	20-29
Age at Marriage, Husband	2	1	2-3	2-2
Age at Marriage, Wife	10	6	2-3	2-3
Country of Birth of Wife and/or Husband	2	0	0-1	0
Highest School Grade, Husband	26	15	1-2	0-1
Highest School Grade, Wife	16	12	0-1	0-1
Previous Marriage of Husband	12	14	0-1	0-1
Previous Marriage of Wife	12	13	0-1	0-1
Religious Preference of Husband	3	6	0-1	1-2
Religious Preference of Wife	0	4	0	0-1
Year of Marriage	72	14	80-85	15-16
Years Lived in Large Cities	28	4	2-3	0-1

¹ If the Form A for 41 of these couples had been completed instead of being stopped when (or soon after) one or more reasons for misclassification as to eligibility had been discovered, it is probable that the numbers in the "one error" column would be somewhat smaller and that these reductions would be more than doubled by increases in the "two or more errors" column.

² Estimated from the columns to the left and the data referred to in the text.

³ Two errors affecting eligibility were found on the Survey schedules of 35 couples, three on those of five couples, and four on that of one couple.

wife fourth on each list. The primary reason for such differences is the fact that an error of one year in reporting age will affect the eligibility of few couples, since a large majority of wives and husbands marry several years before the limits established (ages 30 and 40, respectively). In contrast, an error of one year in reporting year of marriage will affect the eligibility of approximately 40 per cent of the couples actually married between January 1, 1926 and December 31, 1930.

The number of couples who actually were eligible but who appeared to be ineligible because of errors on the Survey schedules cannot be determined definitely, but can be estimated from the foregoing list, the frequency of various types of errors as shown in Tables 3, 5, and 6, and other available facts. Because the ratio of Protestant to non-Protestant wives and husbands in the age groups concerned is over five to one in Indianapolis, and because only 1.2 per cent of the persons reported as Protestant (or as "none") were found to be Catholic, Jewish or "other," it is probable that not more than two or three couples were misclassified as ineligible because the question on religion was not answered correctly in the Survey. Still fewer native couples are believed to have been reported as foreign born in the Survey.

Errors in reporting whether previously married should result primarily from omitting a previous marriage rather than reporting a nonexistent marriage. Because of this probability, because wives and husbands married only once outnumbered those married more than once by at least eight to one, and because only 1.6 per cent of the reports of no previous marriage were incorrect, it is believed that only two or three couples with wife and/or husband reported as married more than once actually were eligible.

As stated earlier, a large majority of the otherwise eligible couples reported more than eight years' residence (since marriage) in cities of 25,000 or more, and were correct in doing so. Among the 12.0 per cent whose reports were wrong, overstatements exceeded understatements by over two to one. Consequently it would be expected that only three or four couples who appeared ineligible because they were reported as living less than eight years in large cities actually had lived in them longer and were eligible.

Among the once-married Protestant couples in the Survey who married during 1927-1929, 98.6 per cent of the wives were under 30 years of age, and 99.5 per cent of the husbands were under 40 at marriage. The few who were older at marriage had reached at least ages 41 and 51, respectively, at the time of the Survey. Judging from the data in Table 5 there is a strong tendency (three to one) for a wife's age to be understated if she is 40-44, and a moderate

tendency (three to two) for a husband's age to be overstated if he is 45-52. Only fifteen couples were misclassified as eligible because wife's age at marriage was understated, and three because of a similar error for husbands. It would be expected, therefore, that four to six couples were misclassified as ineligible because the wife's age was overstated, and four or five couples because the husband's age was overstated, the former appearing to be over 30 and the latter over 40 at marriage.

Approximately 93 per cent of the wives and 92 per cent of the husbands in the age groups concerned were reported in the Survey as having completed at least the eighth grade. According to Table 6, these reports were incorrect for 23.2 per cent of the former and 28.2 of the latter, with overstatements of education outnumbering understatements by over two to one for wives, and nearly seven to four for husbands. An equally strong tendency to overstate education would be expected among those with less schooling. It is probable, therefore, that not more than two couples were misclassified as ineligible because the wife's education was misstated as less than eighth grade, and not more than three because of a similar misstatement for the husband.

The effect of misstatement of year of marriage remains to be considered. Important here are (a) the absence of a tendency to report a year ending in one digit (zero or five) rather than another (one or nine) as occurs with age; (b) a moderate tendency (five to two) to postdate rather than antedate year of marriage; and (c) a larger number of marriages in Marion County, Indiana¹ during 1927-29 (11,865) than during 1924-26 (11,718) or 1930-32 (9,959). The net result of these factors is that for every seven couples erroneously classified as eligible there should be eight erroneously classified as ineligible. In other words, it is probable that approximately 95 to 101 couples reported as married before 1927 or after 1929 and classified as ineligible, actually were married during 1927-29 and were eligible.

If the above estimates are combined and if allowance is made for two or more errors occurring for some couples, it appears that between 96 and 114 couples actually eligible for the Study were classified as ineligible. This is only 7.3 to 8.6 per cent of the couples whose eligibility was verified in the Study. It may be concluded, therefore, that the Survey was fairly satisfactory from the standpoint of its primary function, the locating of couples for the Study.

¹ The published reports of number of marriages by counties in Indiana do not distinguish between residents of the county seat and those of the remainder of the county.

ANNOTATIONS

POSTWAR PLANS OF THE UNITED NATIONS¹

THIS volume was designed to present a brief factual survey of the proposals for postwar economic organization and planning advanced by official and private groups in the various United Nations.

As might be expected, major attention is directed to proposals developed in the United States, the United Kingdom, and the various members of the British Empire group, with brief sections on planning in the Latin American countries, and somewhat more extended outlines of the programs of China and the Soviet Union. A few pages are devoted to the proposals of the governments in exile, and to the scattered impressions that could be gathered, at the time the study was made, of the thinking of underground groups in the axis-occupied territories.

Although any survey of postwar planning prior to the turn of the tide in Europe is necessarily dated as regards specific proposals, the volume is nevertheless useful for the broad picture that it affords of the diverse strands of thought that have been revealed in the consideration of postwar problems throughout the world. Although the study explicitly avoids critical analysis the various programs are set forth against the background of varying basic economic conditions and ideologies that prevailed before the war and are likely to continue to influence the policies of different countries after the war. Thus the study helps to put in perspective the difficulties that are now being and will hereafter continue to be encountered in achieving a stable basis for harmonious economic relationships among the countries of the postwar world. It will, accordingly, be useful for some time to come in providing an orientation and point of departure for the consideration of the problems of economic, social, and political

¹ Lorwin, Lewis L.: *POSTWAR PLANS OF THE UNITED NATIONS*. New York, The Twentieth Century Fund. 1943, 319 pp. \$2.50.

relationships as they now emerge into the foreground of national and international discussion.

ARCHIBALD M. McISAAC

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POPULATION FACTS AND POLICIES IN GREAT BRITAIN¹

ACCORDING to estimates of various British and American demographers, England is now experiencing the crest of her population growth. Among the latter, Notestein and his colleagues have said, "Even before the present war there was a strong probability that England's population would commence to fall in the near future. On the basis of the projections [of the population of European countries to 1970], with the exception of France, England and Wales experiences the greatest population decline among the countries of Europe. From its assumed maximum of 41.1 million in 1945 it drops to 37.1 million in 1970, or about 10 per cent."²

Whether or not the current year actually witnesses the peak population, there is no doubt that England and Wales are confronted with the prospect of an early decline in numbers unless substantial and unexpected increases in fertility occur. The need for preventing or minimizing this future decline has been repeatedly emphasized in the so-called "Beveridge Plan" and in the speeches of Winston Churchill. Last year a Royal Commission on Population was appointed to study the factors underlying the trend of population and to make recommendations.

In the search for ways and means of encouraging larger families Great Britain will doubtless be satisfied only with those schemes that are consonant with the principles of a democracy. Indeed, the very appearance of the booklet under review, *POPULATION FACTS AND POLICIES*, suggests that any plan that Great Britain finally evolves will not be one that is "handed down" by the politicians or even by the experts on the Royal Commission, but will to some extent be an outgrowth of what the people want. For this booklet was prepared in response to the demands for a "study outline," for purposes of group discussions throughout the country.

¹ Hubback, Eva M.: *POPULATION FACTS AND POLICIES*. London, George Allen & Unwin, Ltd., 1945, pp. 48 (paper), 2s. 6d.

² Notestein, F. W.; Tacuber, I. B.; Kirk, D.; Coale, A. J.; and Kiser, L. K.: *THE FUTURE POPULATION OF EUROPE AND THE SOVIET UNION*. Geneva, League of Nations, 1944, p. 60.

Pretending to furnish no more than an outline, the author simply sketches the available facts regarding demographic trends, briefly discusses the possible consequences and causes of those trends, and presents a systematic summary of what might be attempted by way of encouraging larger families in her country.

With respect to causes of the declining size of family, the author rightly lays the emphasis on voluntary instead of involuntary (biological deterioration) factors. She correctly emphasizes that contraception is only a mechanism or means of family limitation and that the real causes are embedded in the changing values and attitudes associated with the transition from rural to urban economy. Her outline of causes of voluntary family restriction includes the following topics: change in individual and social attitudes since 1870, limitation of the desire for children, the economic factor, changes in social life—the position of women, changes in family habits, housing, diminution in religious belief, and insecurity.

With regard to policies, the author states: "The kernel of the problem is how to combine the voluntary principle of free parenthood and wanted children, with the needs of the community. . . . Population policies in this country must be two-sided. . . . In the first place, we must do everything possible to encourage parents to want more children; secondly we must endeavour to remove the social and financial handicaps at present imposed on parenthood" (p. 31). According to the author, the policies aimed at stimulating stronger desires for children might include a whole range of social reforms designed to give security from poverty, unemployment, and war, and hence encourage a more vigorous and hopeful attitude toward life itself. They might also include specific educational programs on the need for more children, and education for family living.

The plans considered for reducing the economic handicaps on parenthood include (a) cash allowances in the form of marriage loans and bonuses, maternity benefits, and children's allowances; (b) government subsidies of essential foodstuffs; (c) taxation; and (d) a wide range of social services affecting mothers and children, such as maternity and child welfare services, improvements in schools, better housing through rental rebates, and miscellaneous health services.

Although the quantitative aspects of population are emphasized, questions regarding quality are also considered. In this connection the author takes the stand that as long as gross inequalities of environment exist it will be impossible to distinguish between the better and worse strains

except in so far as certain extreme cases are concerned. She therefore believes it essential "to take every possible step to level up the worse environments to the standard of the better ones" (p. 42).

Whether or not this little booklet provides any harbinger of the character of Great Britain's future population policies, it at least suggests that there is a broad base of progressive thinking in that country. It will behoove students of our own country to watch and study developments of population policy in England, for our own country, too, may experience declining numbers before many decades.

CLYDE V. KISER

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WORLD POPULATION IN TRANSITION

THE most impressive thing about this volume¹ is the testimony it bears to the large number of scholars of the first rank who are devoting themselves intensively and objectively to the study of population and its problems. Merely to list those who have contributed to this book, with their respective subjects, would consume a large part of the space allotted to this review.

As Dr. Davis points out in his Foreword, "The study of population offers one of the unique and indispensable approaches to an understanding of world affairs." Nothing is more important than that those who are destined to exercise leadership in world affairs in the immediate future should be dynamically aware of this truth, and the volume in hand should be of great value in bringing this to pass, as well as in providing a concise body of data on which such leadership can be based.

The studies themselves fall into four logical categories. The first and last contain only one essay each. The first is an over-all review by Dr. Davis of the changing demographic phenomena the world over. The last, by Frank Lorimer, is an analysis of the population policies, actual and potential, of various countries, specifically Germany, Sweden, France, the Soviet Union, and the United States.

The second section consists of a number of regional studies by authors of established reputation, covering the United States, South America,

¹ Davis, Kingsley (Editor): *World Population in Transition. The Annals of the American Academy of Political and Social Science*, Philadelphia, January, 1945, Vol. 237, pp. viii + 203, \$2.00 (paper), \$2.50 (cloth).

Central and Caribbean America, postwar Europe, Russia, Japan, China and Southeastern Asia, the British Overseas Dominion, and the Moham-medan world, and a special study dealing with the demographic consequences of European contact with primitive peoples. All but the last of this group are primarily factual, and even statistical, and taken together furnish an admirable compendium of up-to-date material for students approaching the subject from many different angles. Some of this material has previously appeared in other forms, but it acquires new value from its consolidation with related inquiries.

The remaining section comprises several specialized studies of such problems as fertility, longevity, mortality, morbidity, migration, and the level of living. Here, likewise, the authors speak with authority, and this group offers in an outstanding manner a clear presentation of some of the recognized principles that need to be taken into account by the framers of a new and more peaceful world order.

It would be obviously impossible to undertake any summary, or even any detailed criticism, of such a comprehensive and varied group of studies. If attention is called to a few flaws, it is only to provide a little salutary relief to the encompassing praise that has already been administered. More than one of the authors falls into the common error of using the term "stability" to refer to a demographic situation where the birth rate and the death rate are equal, or the net replacement rate is 1.00. The correct term should be "balance" or "stationary condition," unless there is some ground for believing that the situation is not going to change for a considerable time. The concept of stability involves some degree of permanence.

In his statement on page 8, "If the Asiatics come with the traits of modern civilization, there is little reason to exclude them any more than any other people," Dr. Davis goes a little too far in assuming that the general populace of immigrant-receiving countries is as ready to disregard racial differences as some anthropologists are. If there is, as he says a little later on, a "confusion between race and culture" it will have a bearing on the desirability of immigration, no matter how unsound it may be scientifically.

Also, one cannot help questioning the value of giving a whole page (41) to an asymptotic curve based on less than fifty years of census figures and a little over a century of "different estimations."

But these are only tiny gnats in a large jar of ointment.

The treatment throughout the book is almost exclusively quantitative, in the sense that little attention is given to the "eugenic," or biological, considerations of quality. And this is as it should be, in the interest of coherence and unity. The available space is crammed as it is.

HENRY PRATT FAIRCHILD

